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Macroeconomic adjustment in a transition economy: the case of Vietnam

Thi Nhiem Phan
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**MACROECONOMIC ADJUSTMENT
IN A TRANSITION ECONOMY: THE CASE OF VIETNAM**

This thesis is submitted in fulfilment of the
Requirements for the award of the degree

DOCTOR OF PHILOSOPHY

from

UNIVERSITY OF WOLLONGONG

by

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2003

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LIST OF ABBREVIATIONS

ADF	Augmented Dickey-Fuller
AEG	Augmented Engle-Granger test
AFTA	ASEAN Free Trade Area
BTA	Vietnam-US Bilateral Trade Agreement

CEE	Central European Economies
CEPT	Common Effective Preferential Tariff
CIEM	Central Institute for Economic Management
CIS	Commonwealth of Independent States
CGE	Computable General Equilibrium models
CLI	Cumulative Liberalisation Index
CMEA	Council for Mutual Economic Assistance
CPV	Communist Party of Vietnam
CPEs	Centrally Planned Economies
CPI	Consumer Price Index
CRWD	Cointegrating Regression Durbin Watson test
DB	Dornbusch model
DIW	German Institute for Economic Research
DRV	Democratic Republic of Vietnam
ECM	Error Correction Model
EBRD	European Bank for Rural Development
FDI	Foreign Direct Investment
FSU	Non- former Soviet Union
FTOs	Foreign Trade Organizations
FYP	Five Year Plan
GSP	Gross Social Product
GSO	General Statistics Office of Vietnam
GTAP	Global Trade Analysis Project
HK	Harvie and Kearney model
HL	Harvie and Lee model
IFS	International Financial Statistics
I.I.D	Identically Distributed Errors
IMF	International Monetary Fund
MF	Mundell-Fleming model
MFN	Most-Favoured Nation
NAFVN	National Accounting Framework for Vietnam
ODA	Official Development Agent

OECD	Organization for Economic Cooperation and Development
OLS	Ordinary Least Square Regression
PBM	Portfolio Balance Model
PPP	Purchasing Power Parity
SMEs	Small Management Enterprises
SOCBs	State-owned Commercial Banks
SOEs	State-owned Enterprises
UNDP	United Nation Development Programs

ABSTRACT

The objective of this thesis is to develop a dynamic macroeconomic model for Vietnam's transition economy that is capable of analysing the impact of existing and prospective reform measures on its macroeconomic adjustment and development.

The model enables the identification of ways in which reform policies have transmitted their effects to the domestic economy, as well as enabling an exploration of the impact of external shocks on the Vietnamese economy and the policy implications that flow from them. The macroeconomic adjustment policies emphasised in this thesis consist of trade liberalisation, state-owned enterprise privatisation, and expansionary fiscal policy. The findings obtained from this study are important in the context of contemporary Vietnam, in terms of providing the basis for evaluating alternative policy recommendations.

The model developed contains a number of key assumptions. The domestic economy produces output that is consumed domestically and is an imperfect substitute for the imported good equivalent. The price of these goods is domestically determined. The deterministic framework of the model, combined with economic agents possessing rational expectations, is equivalent to the case of perfect foresight. Financial markets are assumed to be in continual equilibrium, while non-financial markets are subject to sticky price and quantity adjustment. The model developed focuses on the long run nature of the dynamic adjustment process, because the reform measures focused upon will exert important long run effects on the Vietnamese economy. This arises from allowing for physical capital stock accumulation and from the requirement that the current account balance must be zero in equilibrium.

A number of specific features are incorporated in the model that make it more applicable to the Vietnamese case: (i) explicitly distinguishing the contributions of both SOEs and the private sector to domestic aggregate supply in examining the impact of privatisation policy; (ii) incorporating trade restrictions on either exports and imports in analysing the impact of external liberalisation on the economy; (iii) explicitly distinguishing the composition of government expenditure (current and capital) in analysing the impact of expansionary public investment spending on domestic private investment capital as well as economic development in Vietnam; and (iv) distinguishing macroeconomic outcomes from a fixed exchange rate with imperfect capital mobility system to that from a flexible exchange rate with perfect capital mobility system.

Three types of policy reforms are simulated: (1) in carrying out privatisation it is assumed that 5 per cent of the capital stock of SOEs is given to the private sector; (2) the nominal exchange rate is assumed to be devalued by 5 per cent; (3) and the tariff rate is assumed to be reduced by 5 per cent. For each shock, with the assumption that the economy is operating in a fixed exchange rate system, the simulation was carried out at different speeds, gradually and immediately. Two extreme reform packages, in which privatisation, tariff reform, and devaluation are undertaken at the same time,

designed to illustrate the more complex cases of gradualism and shock therapy approaches, are also considered. In addition, these shocks are considered in an alternative model, in which a flexible exchange rate with perfect capital mobility is assumed. The impact of changes in government capital expenditure, combined with these reform policies, on the Vietnamese economy, are then explicitly analysed.

The simulation results suggest that different reform policies can have different effects upon the Vietnamese economy. The main findings from the simulation results for the single policy (exchange rate devaluation, tariff reduction, and privatisation) indicate that, under the fixed exchange rate and imperfect capital mobility system, for the short run period, the government should adopt the “Big Bang” approach because this has positive impacts upon Vietnamese economic development. For the medium and long run periods this approach would still be advisable for the case of an exchange rate devaluation, because by adopting this approach the deterioration of the private capital stock, aggregate supply, and international competitiveness could be minimised. However, there is no difference in the impact upon Vietnamese economic development irrespective of whether the application of the tariff reduction and SOE privatisation is up-front or partial. When these three policies are conducted at the same time, the “Big Bang” approach is still the “best” approach for the macroeconomic variables except for foreign asset stocks, which can have a benefit only from the reform package if it is done gradually over a specific period of time.

For the complete reform policy package, when comparing the alternative versions of the model, under a floating exchange rate and liberalised capital controls, the gradual approach is somewhat better than the “Big Bang” approach in regard to the increase of domestic production, private investment and international competitiveness over the short and medium run periods. The major conclusion obtained from the comparison between the two versions of the model is that the reform package, when introduced gradually in the flexible exchange rate system with deregulated financial markets, can produce better macroeconomic outcomes for Vietnam. This conclusion is also supported from a simulation involving a temporary increase in public capital spending combined with a reform package.

CHAPTER 1

INTRODUCTION

1.1 Overview and issues to be addressed

In the late 1980s and early 1990s one of the most important features of the global economy was the economic transformation in former centrally planned economies in Europe and Asia to a market economy. Altogether over 30 countries with a population about one-third of all mankind, were involved in these dramatic changes. The implications were vital not only for these nations, but also for the entire world.

An indispensable part of the transition to a market system was the opening up of former socialist countries and their integration into the global economy. Transition is a process involving a fundamental shift leading from the centrally planned economy based on the dominance of state ownership toward a free market, with the private sector in the key role. Thus, the transition entails the introduction of entirely new institutional arrangements. A market economy requires not only liberal regulation and private ownership, but also adequate institutions. This is a process of replacing an old system with a new one. It is not simply another attempt to refurbish the old system by tinkering with the way it performs. For this reason transition is a lengthy process comprised of various spheres of economic activities.

In a broad sense, transition implies: (i) liberalising economic activity, prices, and market operations, along with reallocating resources to their most efficient use; (ii) developing indirect, market-oriented instruments for macroeconomic stabilisation; achieving effective enterprise management and economic efficiency, usually through privatisation; (iii) imposing hard budget constraints, which provides incentives to improve efficiency; and (iv) establishing an institutional and legal framework to secure property rights, the rule of law, and transparent market-entry regulations (Havrylyshyn and Wolf, 1999). While there was never much doubt about what had to be done, one of the big

disputes about the transition to a market economy concerned how fast it could, or should, be undertaken, and in what order various reform measures should be carried out. Although the discussion has been wide-ranging the consensus focuses on two approaches, namely the “Big Bang” or “shock therapy” and “Gradualism” approaches.

The case for “Big Bang” is made on the basis of four main arguments. First, a rapid reform process increases the incentives to relocate resources, resulting in a more rapid relocation of resources and, therefore, lower adjustment costs than if the relocation was prolonged. Second, a fast reform process affords better coordination in the implementation of the reform. Third, speed helps establish credibility in the reform process leading the foreign investors to increase investment and the private sector to relocate resources rapidly and also increase investment. Fourth, a rapid introduction of reforms can overcome the political resistance to prolonged reforms, leading to an effective implementation of the reform package (Feltenstein and Nsouli, 2001).

The case of gradualism is also made on the grounds of four arguments. First, a fixed cost of adjustment is spread over a longer period of time, thereby reducing its short-run cost (Nutti and Portes, 1993). Thus, there is likely to be more political support for a phased approach. Second, it takes time to build a new world since it is impossible to enact all measures in a short period of time (Murrell, 1990). Third, to the extent that the use of certain instruments can be incompatible with certain targets, a phased approach to reforms is needed. Finally, it is impossible to introduce many reforms at once (Gelb and Fischer, 1991).

Although debate about the speed of reforms are currently much less acute than before, the theoretical, as well as empirical, work on the subject have not established the superiority of one course of reform over another. There are cases where fast (Eastern European countries or Vietnam in the beginning of the transition period) and gradual (China) reformers have succeeded and where they have failed (former Soviet Union countries). In general, the discussion in the literature has been fragmented in that it has taken a sectoral rather than a comprehensive look at the reform packages. In addition, there

has been little analysis of the underlying analytical models which can be used to explain the superiority of one course of each reform policy over another, or the reform packages as a whole, particularly in terms of the experience of the East Asian transition economies. To some extent this is due to a number of methodological limitations which are as follows.

Firstly, no single theoretical model is applicable over the entire transition process, as the transition economies will change from one form (centrally planned economy) to another (market economy) over the period. With no single applicable theoretical form, equation specification is highly problematic. Thus simulation and policy analysis would then seem to be very difficult.

Second, the data that reflect the transition period set in place to date are not of a sufficient duration, and therefore will not yield enough observations to justify an estimation-based model. Generating the direction for gathering the needed data in the most efficient and useful manner is often used to overcome this limitation. Consequently, computable general equilibrium (CGE) models, which are static in nature but use the least data-intensive technique, have been widely applied.

Finally, given the complexity and dynamism of the transition process, there is an urgent need to develop a dynamic macroeconomic model that can be used for simulation purposes to show whether the reform policies, in individual or in package, lead to improved macroeconomic development. Although there has not been any model in this style applied to a transition economy, based on some existing theoretical models contributed by Mundell and Fleming (1961), and Dornbusch (1976) among others, one can develop a model for this purpose with the necessary amendments and with the features of a transition economy.

The aforementioned deficiencies are especially reinforced in the case of Vietnam. The Vietnamese economy is distinguished by being an undeveloped economy when it started the transition process, and having the objective of building a market economy with a “socialist orientation”. The country has embarked upon transition since the mid-1980s, when it found itself facing an economic crisis resulting from the gradual approach to socialist transformation. In the first period of transition to a market-oriented economy

1986-1988 the reforms can be characterised as being based on a gradual approach. Production in agriculture and by industrial state enterprises increased, but the co-existence of the plan system and the free market led to unmanageable problems, which were reflected in hyper-inflationary conditions by the end of 1988.

The subsequent round of economic reforms in 1989 carried many of the characteristics of the “Big Bang” approach. Prices were completely liberalised, the exchange rate was liberalised and devalued, barriers to external trade were removed, the real interest rate was sharply increased and state enterprises could no longer count on subsidies from the government budget. The impact of these measures was a slowdown of economic growth in the subsequent years, but it was only temporary. By 1992 the growth rate settled at about eight per cent and remained there for another five years. However, the Asian financial crisis of mid-1997 contributed to a slowing down of economic reforms in Vietnam. To avoid an adverse impact of the crisis on the economy the government adopted a more cautious economic stance, giving priority to ensuring macroeconomic stability rather than taking risks in order to achieve higher growth. Therefore, it could be suggested that the period after 1997 has been characterised by a slow gradual approach. Consequently, economic growth has slowed down, the competitiveness of Vietnamese goods was weakened due to a relative appreciation of the Vietnamese currency compared with other currencies in the East Asian region, state enterprises and banks were performing poorly, and public services and fiscal balances were under pressure. However, the contribution by economists, in and outside the country, to the analysis of the impact of the reform policies, in particular their speeds and sequencing, on macroeconomic performance in order to provide a basis for policy recommendations for Vietnam is still limited.

In summary, the study of the modelling of macroeconomic adjustment policies in transition economies is undoubtedly of practical and theoretical importance. However, this subject area is characterised by a number of important knowledge gaps concerning essential issues, including model-specification to capture the essential features of a transition economy, and appropriate estimation methodologies. This study attempts to reduce these

gaps by developing an analytical framework to study the macroeconomic adjustment policies, and their implications, for Vietnam's economic transition.

1.2 Objectives and scope of the thesis

The study has the following general and specific objectives.

A. General

1. To study the literature on transition economies with the objective of identifying the key issues involved in the process of transition from a planned to market economy, in terms of both the policies required and the conditions for choosing such policies and, more controversially, the speed and sequencing of such policies.

2. To present the recent growth profile of the Vietnamese economy, its different phases of development, and the macroeconomic adjustment policies implemented during the transition period since 1986. The theoretical and empirical basis upon which Vietnam's reforms relating to internal and external liberalisation, and privatisation and restructuring of state-owned enterprises is based will be scrutinised.

3. To analyse the theoretical framework of the current state of the art of macroeconomic models in transition economies, and to discuss the nature of the empirical work on macroeconomic modelling that has been so far in the context of Vietnam. These works are undertaken in order to identify the gaps so as to build a dynamic macroeconomic model that take note of the Vietnamese current economic reforms and provide a basis for policy recommendations for the Vietnamese government.

B. Specific

1. To identify the dynamic macroeconomic adjustment process arising from two policies, devaluation of the exchange rate and tariff reduction. At one extreme, there is an up-front devaluation and tariff reduction, and at the other these policies are introduced gradually through several discrete steps.

2. To explore the effect of the policy of privatisation or restructuring of state-owned enterprises, introduced gradually or immediately, on some key macroeconomic indicators.

3. To investigate the impact of variations of public investment spending on private investment as well as on macroeconomic development.

4. To conduct a comparison between the adjustment path for the economy under two exchange rate regimes, fixed and flexible, where the reform package is implemented immediately and that where it is implemented gradually.

Specifically, the study poses and seeks answers to the following key research questions: (i) what are the key elements of reform required during the transition process, how fast can, or should, these reform policies be undertaken, and what order should various reform measures be carried out. In particular these questions are examined to distinguish the experiences between the transition economies in Europe and Asia; (ii) what were the main reform policies and how were they applied in each period of Vietnam's transition process, and how have these policies affected the development of the Vietnamese economy; (iii) whether the models or frameworks that have been used for analysing the macroeconomic adjustment changes in the transition economies, particularly in Vietnam, can satisfy the study's above-mentioned objectives. If not, what existing theoretical models can provide the basis and how do they need to be modified, in order to suit the characteristics of the Vietnamese economy; and (iv) what are the most appropriate policy responses to the internal and external shocks facing Vietnam.

1.3 Study methodology

1.3.1 Data sources

The statistical data used in empirically estimating the model developed in Chapter 5 have been obtained from a number of different sources. Statistics on GDP, private and state consumption, total investment, capital stock, total exports and imports were collected from the General Statistics Office (GSO) of Vietnam and the annual reports of the World Bank

and United Nations Development Programs (UNDP), various issues. Financial figures, monetary aggregates and the general price level were obtained from various reports produced by the International Monetary Fund (IMF). International figures including world real income, proxied by real GDP in billions of US dollars, for the ten major trading partners with Vietnam, the world price level and world nominal interest rate were taken from International Financial Statistics (IFS). These data are limited to annual data for the sample period 1986-2001.

In addition, in order to examine the long run dynamic macroeconomic adjustment process in response to external and policy shocks in Vietnam, the coefficient parameter values were derived from both the estimation of the developed model in Chapter 6 and Harvie and Lee (HL) (1996) and Harvie and Kearney (HK) (1996) models for use in the simulation analysis.

1.3.2 Method of study

This study will primarily be a modelling exercise. A dynamic macroeconomic model for Vietnam, which is based on three general theoretical foundations contributed by Mundell-Fleming (1963), Dornbush (1976) and Branson (1977, 1984), and two specific models of Harvie-Lee (1996) and Harvie-Kearney (1996), will be developed and presented in Chapter 5. These basic models enable an analysis of the dynamic adjustment process from an initial equilibrium towards a new equilibrium, arising from external shocks to the economy.

In the HL and HK models, and also in this study, a deterministic framework is adopted. The deterministic model used here is analysed under the assumptions of rational expectations and this is equivalent to the case of perfect foresight. It is assumed that financial markets are in continual equilibrium while non-financial markets are subject to sticky price and quantity adjustment. Such stickiness of adjustment of non-financial markets can cause economic variables to overshoot or undershoot their equilibrium values, and produce different adjustment processes. The analysis will emphasise the long run

nature of the adjustment process, since the external shocks and policy changes will have a long run impact on the economy, by inclusion of capital stock accumulation/decumulation in the product market and foreign asset stock accumulation/decumulation arising from developments in the current account.

However, a number of significant amendments are required to make this framework more applicable to the specific features of Vietnam as a transition economy. The model will focus on four types of policy reforms currently applied: exchange rate policy, external sector liberalisation, state enterprise reform, and expansionary fiscal policy, which have not been considered before for Vietnam in the context of the theoretical and empirical frameworks adopted. First, the model explicitly distinguishes the contributions of both SOEs and the private sector to domestic aggregate supply. This is conducted to examine the impact of the privatisation policy. It is assumed that the private sector is more efficient than the public sector so privatisation of SOE capital stocks means that the capital of SOEs is simply given to the private sector, and as a result the private capital stock and private wealth will increase. Second, trade restrictions on either exports and imports are incorporated in the model. Relaxing trade restrictions through tariff reduction has a direct effect upon exports and imports, which are major contributions to an increase in aggregate demand. Third, it is extended to distinguish the role between public investment spending and public consumption spending upon the adjustment process. Public investment may contribute to the level of aggregate supply. An increase in public investment spending, in particular on infrastructure projects in Vietnam, may lead to favourable developments for the Vietnamese economy. Fourth, a fixed exchange rate and imperfect capital mobility are assumed. This is because asset markets in Vietnam are not well developed as in most other transition economies, and therefore domestic and foreign financial assets are not perfect substitutes. Fifth, the analysis focuses on adjustment under both a fixed exchange rate with imperfect capital mobility system and a flexible exchange rate with perfect capital mobility system, which is relevant to Vietnam when it integrates into the world market. Finally, the

importance of income, wealth and the current account for the dynamic adjustment process is emphasised.

1.3.3 Estimation of the model

The model is estimated using three packages, TSP (versions 4.4 and 4.5), Microfit 4 and Shazam (version 9). The data utilised for the estimation are yearly data from 1986 to 2001. A simple method - Ordinary Least Square (OLS) regression is first utilised for the estimation of the behavioural equations. However, using this simple approach, which often ignores the non-stationary properties of the time series data, may cause misleading statistical and therefore economic inferences. It is therefore necessary to ensure whether the time series are stationary before proceeding to econometric estimation.

Two methods are applied to examine the time series properties of the variables. From an informal examination by graphing the data it might be concluded that the variables under consideration are well characterised as non-stationary in the levels and first difference, but stationary in the second difference, which means that the variables are integrated of order $I(2)$. The formal augmented Dickey-Fuller (ADF) test is applied to test for the presence of unit roots. However, the conclusion of the order of the variables, $I(1)$ or $I(2)$, from this test are inconclusive because the critical values for unit root tests tabulated by Fuller (1976) or Dickey and Fuller (1981) have a sample size of at least 50, whilst the sample size of data used in this study has only 16 observations. The critical values for smaller sample sizes are not presently available.

With the assumption that the variables of interest are integrated in the same order of $I(1)$, two simple methods, Engle-Granger (EG) or Augmented Engle-Granger (AEG) test and the cointegrating regression Durbin Watson (CRWD) test provided by Sargan Bhargava (1983), are applied to detect for the existence of long run relationships between the variables involved. Where evidence of a long run relationship is found, the error correction model (Granger, (1986) and Engle and Granger (1987)) is estimated by OLS, incorporating the short run dynamics of the system with the information from the long run

cointegration relationship. However, these procedures are not applied when it is assumed that the variables are integrated of order $I(2)$ due to the limitation of small sample size.

This study also applies the bootstrap method, initiated by Efron (1979), for correcting the problem of small sample size in estimating the behavioural equations of the developed model. The bootstrap method in OLS regressions is conducted first to examine how good the OLS coefficient values previously estimated are, and whether they are biased. Then it is applied to check the accuracy of the tests of unit roots estimated previously. Although having been affected by a serious “degrees of freedom” problem, the results obtained from these various approaches indicate that OLS regression based on the levels of the logarithm variables can give reliable coefficients in terms of their magnitudes. Therefore, it can be useful in providing a range of possible parameter values to be used in the simulation analysis conducted in Chapter 7.

1.3.4 Simulation of the model

The parameters, both estimated and imposed, are then used to conduct a simulation analysis to examine what policy options should be used in response to external shocks. Due to the complexity of the model developed, it is not possible to derive analytically unambiguous results for the steady state properties of the model. Thus, an analysis of the steady state and dynamic properties of the model is conducted by numerical simulation or calibration. The program utilised to derive these results is called “Saddlepoint”, which is designed for solving linear rational expectations models with constant coefficients. It is a continuous time analogue of the first order linear difference model with rational expectations of the type studied in Blanchard and Khan (1980).

1.4 Organisation of the study

The chapter scheme is organised in accordance with the following order:

Chapter 2 – Literature Review of Transition Economies provides a critical overview of recent literature concerning transition economies. The main focus is placed upon the causes of collapse of the centrally planned economies by the end of the 1980s, identifying the key reform policies required in the process of transition from planned to market economies, their sequencing and speeds. This chapter also considers the achievements of the transforming countries after a decade of economic reform, and analyses the wide differences of economic performance among transition economies in Europe and Asia.

Chapter 3 – The Economy of Vietnam presents an overview of Vietnam's development performance since its reunification in 1976. Particular attention is given to the period of transition from a centrally planned economy to a market economy (1986-present). This chapter highlights the analytical framework underlying the current economic changes and provides a critical assessment of the transition process. An analysis of the performance of macroeconomic policies has been done by looking at various macroeconomic indicators. This chapter also identifies the major macroeconomic problems currently facing the Vietnamese economy.

Chapter 4 – Economic Transition and Macroeconomic Adjustment: Theories and Empirical Evidence covers a comprehensive review of the theoretical and empirical models developed for transition economies and Vietnam in particular. A macroeconometric model, computable general equilibrium and multi-sectoral models constructed for the Vietnamese economy are examined in order to identify gaps in knowledge that can be covered by this study.

Chapter 5 – Modelling Macroeconomic Adjustment in Vietnam's Transition Economy aims to develop a dynamic macroeconomic model for Vietnam based on the contributions of three existing models, namely, Mundell-Fleming (1963), Dornbusch (1976) and Branson (1977, 1984), and most importantly that of Harvie-Lee (1996) and Harvie-Kearney (1996).

The focus of this chapter is also to provide a critical appraisal of the existing policy-based theoretical models, which can provide the basic building blocks for a dynamic macroeconomic model developed for Vietnam. A number of amendments to these theoretical models also are discussed in order to make them more applicable to Vietnam.

Chapter 6 – Empirical Estimation of the Model presents the empirical estimations derived from the model developed in Chapter 5. The data sources and the econometric methods used to estimate the model are described.

Chapter 7 – Simulation Analysis and Policy Implications investigates the effects of alternative paths for the Vietnamese economy corresponding to different assumptions regarding policy changes and reforms. Although there are many other reforms that can be examined, this study concerns four types of policy reforms: exchange rate policy, external sector liberalisation, state enterprise reform, and public investment spending policy. A comparison between the two exchange rate regimes, fixed and flexible, in which the reform package is implemented immediately (“Big Bang” case) and gradually (“Gradualism” case) is also conducted in this chapter, in order to provide a basis for policy recommendations for Vietnam.

Chapter 8 – Summary and Conclusions brings together the major findings of the study and brings out policy implications to be followed by Vietnam. A number of limitations of the study are indicated along with suggestions regarding areas of further research.

CHAPTER 2

LITERATURE REVIEW OF TRANSITION ECONOMIES

2.1 Introduction

The dramatic collapse of the East European Socialist Bloc and the disintegration of the Soviet Union, at the outset of the 1990s, set in motion for all the formerly centrally planned economies (CPEs) an economic transition towards market-oriented economies. The new term of “transition or transformation economy” has emerged since then and is used to describe economies where production and allocation of all resources were once controlled by state planning, but which are moving to decentralized production decision making and market allocation of resources underpinned by widespread private ownership (World Development Report, 1996). Such a transition has involved 31 countries in Europe and Asia containing one-third of the world’s population¹. As this transition has involved many countries, and has very few precedent theories², there was a sharp increase in the macroeconomic study of transition economies by many economists. A considerable amount of theoretical literature exists, accompanied by substantial empirical investigations, on transitional economies, subsequently focusing upon economic models of transition, sequencing of reform, with emphasis on key ingredients for its success. This has involved a general as well as country specific analysis.

¹ **Transition economies in Europe and the former Soviet Union**

Central European Economies (CEE)

Albania, Bulgaria, Croatia, Czech Republic, FYR Macedonia, Hungary, Poland, Romania, Slovak Republic, Slovenia

Baltics Estonia, Latvia, Lithuania

Commonwealth of Independent States (CIS)

Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyz Republic, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan

Transition economies in Asia

Cambodia, China, Laos, Mongolia, Myanmar, Vietnam.

² The closest would have been Chile from 1973 with the overthrow of the democratically elected Allende government.

The main purpose of this chapter is to overview a range of issues related to the transition economies, touching on key problems of sequencing and speed of reform policies, which provides the theoretical base for a model developed and simulated in later chapters of this thesis for the case of Vietnam. In fact, the issues of economic transition, including the elements of reforms, sequencing of reforms, and speed of reforms (“Big Bang” versus gradualism), are the leit-motif of this chapter. The structure of the chapter reflects this perspective by including analyses of the ingredients of required macroeconomic stabilisation policies, the development and reform of key markets as well as the structural adjustment policies. However, before going to the main issues of economic transition, Section 2 will review the causes of collapse of the centrally planned economies. This may be explained as a combination of accident and necessity; of domestic and external causes; of economic and political determinants; as influenced by the West or as due to developments within the socialist system. Understanding the causes of their collapse may help to discern the directions of the transition process and its difficulties.

Section 3 identifies the key issues involved in the process of transition from planned to market economies, not only in terms of the policies required but also the conditions for choosing such policies and, more controversially, the sequencing of such policies. Transition will involve a fundamental change of institutions and imply profound social implications. The success of the transition process will depend on the initial economic, social and political situations, and how the government conducts the reform programs.

Section 4 considers the achievements of the transforming countries after a decade of economic reform. However the experiences and successes vary from one country to another, and depend on many factors such as their initial economic conditions, exogenous economic shocks, reform policies, and speed of reforms. This section also briefly analyses the wide differences of economic performance among transition economies in Europe and Asia. It is argued that, in Europe, the best performers are countries that were the most committed to reform at the start and that have carried out reforms rapidly and consistently. However, the story is different in the Asian transition economies where the application of

reform in a partial and phased manner resulted in rapid growth, although this has been volatile in both China and Vietnam.

Finally section 5 presents a summary of the major conclusions derived from this chapter.

2.2 Collapse of Centrally Planned Economies (CPEs)

The period from 1917 to the early 1950s witnessed a number of countries, containing one-third of the world's population, reject the market as a mechanism for allocation of resources and determination of production, and instead embrace the so-called Soviet model of central planning. The main features of this model were: material balance planning for allocating resources; collectivised agriculture; price, wage, interest rate and exchange rate control; emphasis on heavy industry dominated by large state owned enterprises (SOEs) with little priority given to the production of consumer goods; foreign trade control through state trading monopolies; emphasis on economic autarky; and discrimination against the private sector (Harvie, 1998b). While the achievements of the Soviet model were considerable, including: increased output, the attainment of industrialisation, the provision of basic education, housing, jobs for the entire working population, an ability to avoid severe cyclical downturns, a relatively equal income distribution, and welfare system which ensured access to basic goods and services, it was subject to economic and social instability and intrinsic inefficiency, which were a commonly held belief of the collapse of the CPEs. However, understanding and analysing clearly the causes of the collapse may help to discern the directions of the transition process and its difficulties, and also to explain why non-European countries show a different pattern.

As Brus and Laski (1989), Kornai (1992), Lavigne (1995), among others, pointed out the idea of economic rationality that underpinned communism, or socialism, failed over time rather than all at once. A number of following problems were apparent, however, and usually mentioned:

- Economic growth was declining most noticeably during the 1980s, and particularly the second half of the 1980s (see Table 2.1), and always characterised by the prevalence of shortage.
- The productivity of labour and capital was low (see Table 2.2); output per worker was decelerating over time, and output per unit of fixed assets dramatically declined, especially after the mid-1970s.
- Contrary to initial expectations, the socialist system was never conducive to technical development and innovations, except the sectors which were given a high priority such as military and space activity, especially in the former Soviet Union.
- Poor incentives resulted in not only unsatisfactory efficiency but also low and deteriorating quality.
- Environmental devastation was extraordinary over time.

Table 2-1: Growth Rates in the Soviet Union and Eastern Europe, 1950-1990
(annual change of National Material Products, in per cent)

	Bulgaria	Czecho-slovakia	GDR	Hungary	Poland	Romania	USSR
1951-55	12.2	8.1	13.2	5.7	8.6	14.2	11.3
1956-60	9.6	7.0	7.4	6.0	6.6	6.6	9.2
1961-65	6.6	1.9	3.5	4.5	6.2	9.1	5.7
1966-70	8.7	6.9	5.0	6.7	5.9	7.7	7.1
1971-75	7.9	5.7	5.4	6.3	9.7	11.3	5.1
1976-80	6.1	3.7	4.1	2.8	1.2	7.2	3.7
1981-85	3.7	1.8	4.5	1.4	-0.8	4.4	3.2
1986-90	-0.5	1.0	-1.8	-0.5	-0.5	-3.5	1.3

Sources: Table 4.4 Lavigne (1995) - Statistical Yearbook of the CMEA, editions of 1971 and 1986; ECE/UN, Economic Survey of Europe in 1990-91.

Table 2-2: Extensive Growth in Eastern Europe and the Soviet Union (1981-1985)
(average annual percentage change)

	Labour productivity		Capital productivity	
	1981-85	1986-89	1981-85	1986-89
Bulgaria	3.5	4.0	-2.9	-2.2
Czechoslovakia	1.1	2.1	-3.6	-2.1
East Germany	4.3	3.5	0.2	-1.3
Hungary	2.1	2.9 ^a	-2.2	-0.8 ^b
Poland	-0.1	4.5	-3.4	1.2
Rumania	4.2	4.5 ^a	-4.2	-1.2 ^b
Soviet Union	2.7	3.3	-3.1	-2.3

Source: Table 1.5 Rider and Knell (1992) p. 18.

^a 1986-88, ^b 1986-87

Although the command economy had facilitated industrialisation and urbanisation, it lacked an ability to proceed with modernisation. By its very nature, the centrally managed economy favoured large-scale heavy industry with enormous steelworks as its ideal enterprises (Åslund, 1992). It lacked an ability to undertake the transition to small-scale, high-technology and service enterprises. The economic structure stagnated completely after industrialisation, and the socialist economies were unable to substitute capital for labour: thus, while capital was growing, the labour force per unit of capital was not declining, and hence the rate of return to new investment declined to a level of near zero by the mid-1970s (Easterly and Fisher, 1994). In addition, defence and heavy industry tended to carry the greatest political weight, leaving a smaller share of total resources to health, education, and infrastructure.

In response to the situations of declining economic growth and living standard as seen in the whole socialist system, in the 1960s some governments of Eastern European countries attempted to move towards economic decentralisation with the aims of improving the effectiveness of planning and trying new planning techniques. Differences between countries appeared in methods and results. The Soviet Union and East Germany, for example, introduced only limited reforms, which were aimed at strengthening the functioning of centralised management. At the other extreme, Hungary, and until the late

1960s, Czechoslovakia³, adopted further decentralisation. Their aim was to allow some market mechanisms to regulate enterprises within established limits – effectively allowing profits or losses to replace compulsory quantitative targets – shifting emphasis from micro-level decision-making to macro –level targets, policy and direction. Although more radical attempts at reform were attempted in the 1980s, as Table 2.2 shows, the economic growth path in Eastern Europe and the Soviet Union continued to follow an extensive growth path, with little gains in labour productivity and negative growth in capital productivity. Moreover, unfinished construction as a share of construction investment rose in the Soviet Union from 112 per cent in 1970 to 169 per cent in 1985, indicating that chronic shortages remained prevalent (United Nations, 1990). Similarly, investment cycles could also be observed in Eastern Europe. From this “*it becomes immediately apparent that it is the institutional framework which lies behind the crisis in centrally planned economies*”, and “*overcentralisation in the Soviet Union and Eastern Europe was perhaps the most important factor which led to the collapse of these countries*” (Knell and Rider, 1992, p.18).

The collapse of the Soviet centralised planning model led the governments of socialist countries in Europe to reject central planning, and thereafter, each independently embarked on a transition process towards decentralised market driven economies based upon predominant private ownership. A catalyst for the post 1989 economic reforms in these economies was their political reform toward multi-party democracy during this period, for example Poland, Hungary, Czechoslovakia, etc. (Harvie, 1998b).

In the context of the planned developing economies of East Asia, China and Vietnam, their adoption of the Soviet economic model of central planning, collectivised agriculture and state ownership occurred in distinct phases. China adopted this model after the declaration of the People’s Republic in 1949. The general adoption of the Soviet economic model happened in Vietnam after the reunification of the country in 1975. However, the relevance of the system as a model for economic development had already been questioned.

³ This country has been divided into two countries Czech Republic and Slovakia Republic since 1993.

This occurred in China during the period of the Great Leap Forward in the 1950s and again during the ten-year Proletarian Cultural Revolution of the 1960s and 1970s. The first steps away from central planning were taken by China in 1978-9, with agricultural reform and the adoption of an open door policy. Allowing farmers to retain the benefits of increased output had a major impact in an economy that was still overwhelmingly rural and higher rural incomes created a large constituency in favour of reform. Liberalising foreign trade and permitting foreign investment, which was first applied in four special economic zones in the coastal regions, had a more gradual, but still substantial, impact on what had become a closed economy. Similarly, in Vietnam, the implementation of central planning went into decline from the mid 1980s during which its already heavily dependent and moribund economy experienced further macroeconomic crisis and a deteriorating performance. Economic reform began in Vietnam in late 1986 and started also from the agricultural sector. Collectivised farming was replaced by a mixture of arrangements with the general characteristic of greater household responsibility for agricultural production decisions. The economy was opened up to foreign investment and international trade. During 1988 and 1989 the abolition of central planning was accelerated and most price controls were removed. Macroeconomic stability measures and removal of exchange controls supported the reform process. These reform policies will be presented and analysed in detail in the next chapter.

2.3 Economic Transition

As aforementioned the countries referred to as “transition economies” comprise 31 countries in Europe and Asia, including all former members of the Council for Mutual Economic Assistance (CMEA) (excluding Cuba) and a number of additional countries in East Asia and the Balkans region comprising close to 30 per cent of the world’s population. The most common classification partitions the transition countries into four groups as represented in Table 2.3: the EU accession countries (which include the Baltic countries); the countries of the Commonwealth of Independent States (CIS); the East Asian transition

economies; and the other countries in southeastern Europe (excluding the EU accession countries located in the Balkan region) (World Economic Outlook, IMF 2000).

The defining characteristic of the transition countries is their decision to abandon central planning as the principal mode of organising their economies, and to move to market oriented economies with significant private ownership of the means of production. In most of these countries the “transition” coincided with major political transformation, and some, but not all, observers include the shift from a one party autocratic system to a multiparty democracy in their definition of “transition”. In China, and Vietnam, however, the political system has not been modified significantly during the transition process (World Economic Outlook, IMF 2000). In addition to these political differences, transition economies display an enormous diversity in terms of physical and population size, level of economic development in particular, natural resource endowment, and cultural and historical background. With the objectives of raising economic efficiency, promoting economic growth, and improving economic wellbeing it is obvious that the common core elements of the transition process including macrostabilisation, price and market liberalisation (including international trade), restructuring and privatising state enterprises, and re-defining the role of the state, are required to be applied in these transition economies. Nevertheless, the extent of the policies implemented and their sequencing or speed should depend not only on the country’s initial conditions, but also on its external environment and economic strategy. With regard to all these factors, the remainder of this section proceeds to overview the following issues: key elements of reform required during the transition process, the sequencing and speed of reform, “Big Bang” vs. “Gradualism”.

Table 2-3: Transition Economies: Alternative Geographic, Political, and Reform-Effort Groupings¹
(bold script: radical reformers; italic script: intermediate reformers; normal script: slow reformers)

EUROPEAN TRANSITION COUNTRIES								ASIAN TRANSITION COUNTRIES				Memorandum: Centrally planned economies not having embarked on reform
	Members of the Council of Mutual Economic Cooperation (CMEA; ceased to exist in 1991)											
	Associated members		Full members									
	Former Fed. Of Yugoslavia			Ex-Czechoslovakia		Former Soviet Union				Other Asia		
Other Southeast. Europe		EU Accession Countries					Commonwealth of Independent States					
Southeastern Europe (Balkans countries)				Visegrad countries		Baltic countries	Europe	Caucasus	Central Asia			
<i>Albania</i> ²	Yugoslavia	<i>Slovenia</i>	Romania	Hungary	Czech Republic	Estonia	Belarus	<i>Armenia</i>	<i>Kazakhstan</i>	<i>Mongolia</i>	<i>Cambodia</i>	Cuba ³
	Bosnia/Herz.		<i>Bulgaria</i>	Poland	Slovak Republic	Latvia	<i>Moldova</i>	<i>Azerbaijan</i>	<i>Kyrgyz republic</i>	Vietnam	<i>China</i>	North Korea
	Croatia				Slovak Republic	Lithuania	<i>Russia</i>	<i>Georgia</i>	Tajikistan		Lao PDR	
	<i>Macedonia</i>						<i>Ukraine</i>		Turkmenistan			
									Uzbekistan			

¹The reform-effort classification takes as its criterion the average level of the EBRD transition indicator in 1999, choosing the following thresholds: radical reformers (in bold letter) with an indicator above 3; intermediate reformers (in italics) with an indicator between 2 and 3; slow reformers (normal script) with an indicator below 2.

²CMEA membership became inoperative in 1961.

³Member of CMEA from 1972 to 1991.

Source: World Economic Outlook, IMF 2000

2.3.1 Elements of reform

An interesting fact about reform in transition economies is the broad agreement among economists about what needs to be done. Broadly, the elements of reform can be grouped into four categories: macroeconomic stabilisation; price and market reform (the latter emphasising trade reform, labour market reform and financial sector reform); restructuring the role of the state with emphasis on market supportive measures including legal reform, institutional reform; and building the provision of a social safety net.

Macroeconomic stabilisation is a vital ingredient in transition from a planned to a market economy, especially for countries with large internal and external economic imbalances. This involves the use of government fiscal and monetary policies to achieve external and internal macroeconomic stabilisation. Following the recent experiences of some Central and Eastern European (CEE) countries, as well as stabilisation in market economies with large public sectors and problems of monetary overhang from years of financing deficits by printing money, it is clear that tightening fiscal and credit policies can reduce inflation and the current account not only in transition but also in market economies. However, as Fischer and Gelb (1991) argued, there are some differences, which reflect the different microeconomic incentive structures in the two systems. As firms in transition economies were traditionally subsidised by the government and not subject to bankruptcy laws, *'stabilisation policies cannot rely on the same response as those in a market economy'*. For these countries the focus of stabilisation policies may emphasise addressing several prevailing problems. The first problem is the very nature of the socialist economy with its soft budget constraints⁴. In the classical socialist system, state enterprise directors are not concerned about their profits and sometimes are not even aware of them. To solve

⁴ Soft budget constraints, which was first identified by Janos Kornai (1982), happen in the state-owned firms where the managers believe that if they run at a loss, or make smaller profits than they have been instructed to, the state will meet the firm's losses, and not sack them. This is contrasted with a hard budget constraint, where the results of failure to break even, or to achieve required levels of profits, are expected to be catastrophic: for example, closure of the enterprise or dismissal of the management.

this problem the imposition of a hard budget constraint, including the elimination of subsidies that offset the losses of firms, public sector wage controls, and credit ceilings administered by the governments and central banks, is needed. The second problem is the monetary overhang, which is defined as the amount of income consumers have kept on hand because there has been nothing to buy with it. It is argued that there are several broad options to deal with this problem such as currency reform; inflation; raising interest rates; and the sale of state property to the public. The last problem is dealing with external imbalance and exchange rates. Changes in exchange rates and exposure to world markets are the suggestions for economic stabilisation in transition countries. It is argued that the initial exchange rate in transition economies should imply a big undervaluation of the currency (Åslund, 1992). There are two reasons for this argument. First, a sizable initial inflation was inevitable because of the monetary overhang, repressed inflation, the soft budget constraints of enterprises, and the necessary adjustment of relative prices. Second, it was vital to activate exports and balance foreign trade, for which a low exchange rate is of crucial importance.

In market economies liberalisation usually means eliminating price controls and relaxing trade protection in some protected sectors. However, the extent of liberalisation in transition economies is much broader, it includes: abolishing state orders and procurement, state production and trading monopolies, and centralised allocation of foreign exchange. Liberalisation also means freeing entry into production, services, and trade, including the freedom to open a new business, to expand or break up an existing business, and to change product mix, suppliers, customers, or geographical base (World Development Report, 1996).

Privatisation and enterprise restructuring in transition countries has turned into a key issue since the outset of the 1990s. The main contents of privatisation of SOEs would be the establishment of private property rights for the agricultural and industrial sectors, the breaking up of state monopolies, and the closing of non-profitable firms. In reality, these issues had emerged one decade before in the West and in the Third World, but it is

questionable whether transition countries can learn and apply the experiences from these countries. Nevertheless, Åslund (1992) identified two differences as to why transition countries cannot follow the privatisation programs applied in those countries. The first is a difference of scale. While Western privatisation involved tens of enterprises over several years, in transition economies each country needs to privatise thousands of state enterprises. Second, *'the privatisations in the West – and even in developing countries – have occurred in market economies with a multitude of markets, market prices, dominant private ownership, a reasonable market compatible legal system, and basically a market-oriented thinking'* (Åslund, 1992, p. 69). These differences are of vital importance.

There are several factors making privatisation more urgent in transition economies, especially in the CEE. The first one is to create a so-called level playing field for the private sector in order to facilitate a reasonably well-functioning market. The second one is to address the chronic shortage in the economies resulting from a severe bottleneck problem in SOEs. More over, the state administration was badly organized and the staff inadequately trained for many supposed tasks. It was, therefore, vital to introduce a large private sector consisting of both new enterprises and privatised existing SOEs, because it is able to respond to new demands with flexible supply. The last reason is, as argued by some analysts, that privatisation has been treated as a solution to the financial difficulties that the state faces in making the transition. Privatisation would help to generate revenues at a time when ordinary state revenues are falling, assuming that such enterprises can be sold to prospective buyers, mainly to foreign investors since domestic funds may be scarce (Kornai, 1990).

The largest dispute concerns the method of privatisation of state-own enterprises. For the large and medium state-owned enterprises, approaches to privatisation are from extensive efforts at sales to strategic owners including foreign investors, to insider buyouts, to innovative voucher programs involving the creation of large and powerful new financial intermediaries (World Development Report, 1996). However, each approach to privatisation has tradeoffs among various goals.

It is argued that while the best-known model of sales to outsiders had been very successful in established market economies, they have proved costly and slow and far more difficult to implement than anticipated in most CEE countries (World Development Report, 1996). One reason is the limited amount of domestic capital that can accompany a large dependence on foreign capital. Another problem is that it is difficult to place a value on firms offered for sale because of inadequate accounting. A final disadvantage of the sales approach is its perceived unfairness because many citizens cannot participate in the sale process.

Management – employee buyouts, in which employees and their families can use vouchers and cash to buy major stakes in their own firms, are a widely used alternative to sales. This method is relatively fast and easy to implement, both politically and technically. However, the disadvantages and risks are many. One is dealing with the uneven distribution of the benefits and another is that government typically charges low prices to insiders and thus realises little revenue. In addition, by using management – employee buyouts outsiders are prevented from buying shares or they may hesitate to invest in firms with significant insider ownership.

A third form of privatisation distributes vouchers across the population and attempts to allocate assets approximately evenly among voucher holders. The central principle of voucher privatisation is that all citizens above a certain age receive an equal number of vouchers, which they are entitled to exchange within a certain time for shares in thousands of enterprises that are to be privatised. This form of privatisation has been adopted in a number of countries, notably in the Czech Republic, Lithuania, Mongolia, Poland, Romania, Russia, and Latvia. The advantages of free distribution are that utmost equality is achieved, massive and fast privatisation is accomplished. However, it raises no revenue for the government, and it has unclear implications for corporate governance.

The Czech Republic was the first to implement this form of privatisation and had been considered the most successful compared to other countries. However, an Organization for Economic Cooperation and Development (OECD) (1998) report stated

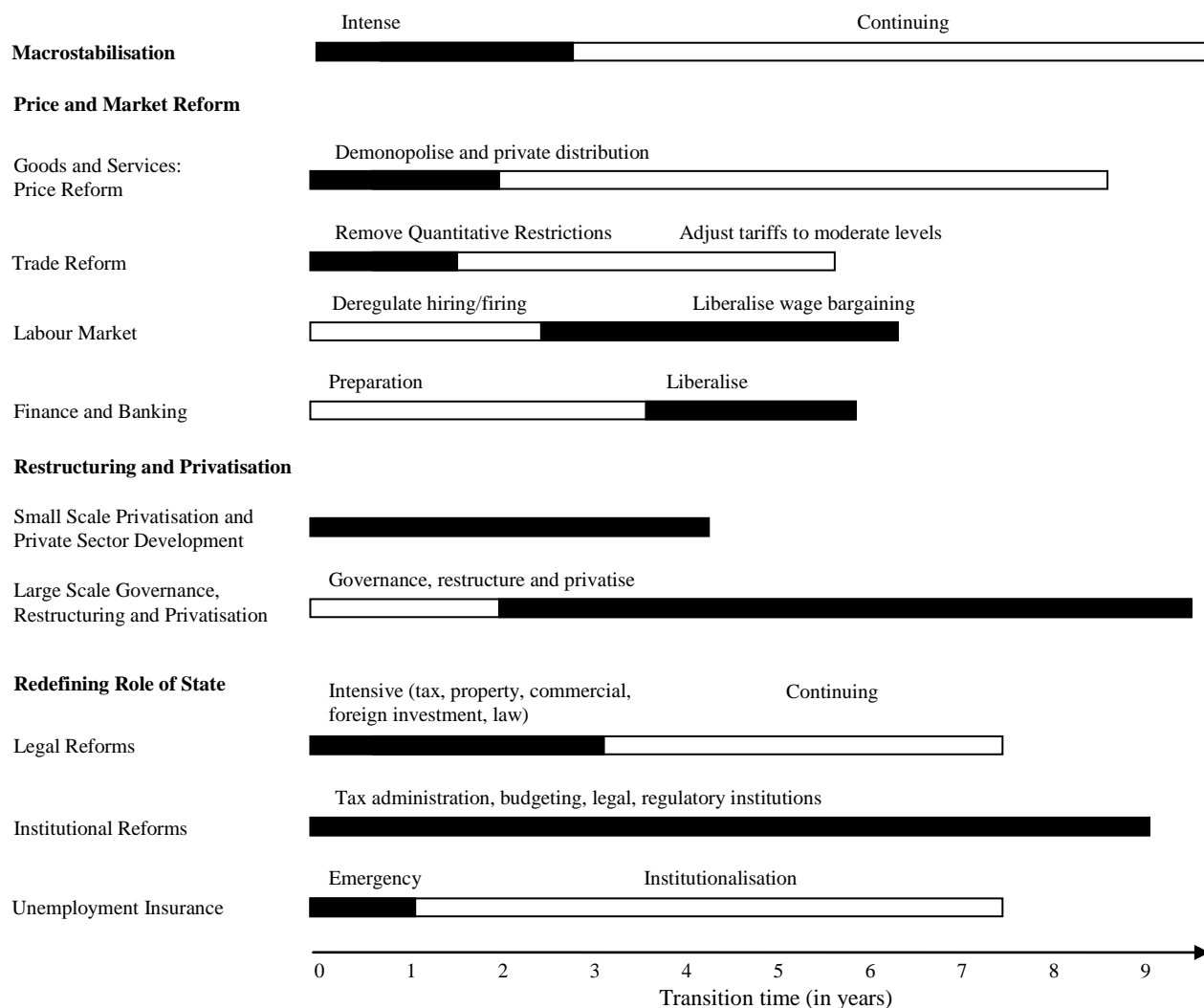
that the Czech voucher approach to privatisation produced ownership that impeded efficient corporate governance and restructuring. The problem was that insufficiently regulated privatisation investment funds ended up owning large and controlling stakes in many firms privatised through vouchers, as citizens sought to limit their risk by transferring their vouchers into these funds in exchange for shares in the latter. But many of the largest funds were owned by the major domestic banks, in which the Czech state retained a controlling or major stake (Nellis, 1999).

Privatising small firms has proved much easier than privatising large ones. Local authorities can take charge of transferring small units, and because they are easier to value many parties can gain access to enough information for open auctions to succeed. It is believed that privatised small businesses can serve as schools for entrepreneurs and investors and can absorb labour being shed from large-scale enterprises.

The last task in a list of elements of reform is creating a new role for the state. This involves redirecting the role of the state away from direct ownership and control over production and distribution and toward a more indirect regulatory role. This would require the creation of new legal systems and effective means for their enforcement, which can establish and apply the rules of the game, lower transaction costs, increase commercial certainty, create incentives for efficiency, and control crime and corruption so that business can focus on productivity activities. Creating a new role for the state also requires strong financial institutions to encourage saving and channel it to its most productive uses, and powerful government to support and complement a set of economic activities as well as social welfare systems.

2.3.2 Sequencing of reform

While there is general consensus over the nature of the reforms to be implemented, the sequencing of those reforms has been intensely debated. Figure 2.1 presents a summary of the major reform areas as well as their proposed sequencing, as originally advanced by Fischer and Gelb (1991).

Figure 2-1: Economic Transition Phases of Reform*

Source: Fischer and Gelb (1991), p.102.

* The dark areas imply greater intensity of reform measures.

A clear message from this figure is that economic transition in reality will require a gradual approach. Short-term focus should be placed on the need to attain macroeconomic stability, including the containment of inflation and the reduction of interest rates, essential for the development of a private oriented market economy. Other key areas for early reform include that of: price liberalisation to enable market signals to play a crucial role in determining resource allocation; trade reform, including that of current account

convertibility to enable rapid integration into the global economy; small scale privatisation; legal and institutional reform to provide the framework essential for the development of an increasingly market oriented economy; and, finally, the establishment of a social safety net, particularly that of unemployment insurance. These would be representative of a minimum “Big Bang” menu of measures. Only later on in the transition process would it be possible to implement reform of the labour market, the banking and finance sector, and the privatisation of large scale SOEs.

In line with the particular sequencing issues, a general consensus was reached on the point that stabilisation should precede structural transformation. It is argued that structural reforms are highly unlikely to be successful in circumstances where there is a concurrent crisis of macroeconomic stabilisation (Sachs, 1989). However, the problem of credibility was seen as essential, so that even at an early stage announcements of systemic measures, such as a quick move toward privatisation and demonopolisation, were highly recommended by experts (Nutti, 1991 and Jeffries, 1993). In fact three issues have dominated the sequencing debate. They were related to liberalisation (both internal and external), to the privatisation of SOEs, and to financial sector reforms.

The first issue in the sequencing debate is over domestic and trade liberalisation. In regard to domestic liberalisation policy, the liberalising of prices emerged in the forefront of the debate. There was widespread concern about a surge in inflation, beyond the expected initial jump once controls and subsidies were lifted. Because most of the producers and retailers were large state enterprises it was feared that they would behave as monopolies to increase prices to the maximum profit level. This would tend to increase wages and thus fuel an inflationary spiral. In addition, a very high ‘monetary overhang’, a natural characteristic of the socialist economies, and excess demand would occur as soon as prices were freed. As price liberalisation may intensify inflation and shortage, there was thus some argument over the issue of demonopolising first, before freeing prices, and eliminating the overhang first as well. However, both debates soon faded away. It became obvious that demonopolising could only go hand in hand with privatising and hence take

time, as Lipton and Sachs (1990) argued that *‘the transition process is a seamless web’* (Lipton and Sachs, 1990, p.99). Besides, large SOEs could not be likened to market-type monopolies and they lacked a global view of the market, especially of the consumer market. On the other hand the monetary overhang was eliminated much more quickly than anticipated through increased prices, which wiped out households’ savings.

Economists have also debated how fast and extensive the liberalisation of foreign trade should be. There is a distinct difference between Lipton and Sachs, who favoured a maximum of instant liberalisation, and McKinnon (1992), who preferred a gradual liberalisation. The reason for choosing instant trade liberalisation is that this package implied the opening up of the domestic market along with a strong devaluation of the domestic currency, and current account convertibility. This also has four advantages. Firstly, price liberalisation would be automatically coupled with competition from abroad, which would prevent the domestic monopolies from increasing their prices sharply. Secondly, the distorted price structure inherited from the past would be corrected by an imported price structure reflecting relative world prices. Thirdly, as an outcome of the devaluation, and provided a fixed or pegged exchange rate regime was selected, the exchange rate would provide a firm nominal ‘anchor’ for the stabilisation program. Finally, a depressed exchange rate would deter imports, so that there would be no need for high tariffs at a time when more openness was required (Lavigne, 1995).

Despite these good reasons, the simultaneity of trade and price liberalisation was questioned. It was argued that excessive devaluation and excessive opening up of the economy exaggerated the initial price shock (Nuti and Portes, 1993), and that too early an exposure to external competition could devastate the domestic economy (McKinnon, 1992). The desirable sequencing of demonopolisation, liberalising domestic markets, and liberalising trade depended on the initial situation of each country embarking on the transition process, and would vary by country. For example, Kaser (1990) posed the choice as *“... whether domestic pricing and foreign trading (which in practice requires sharp devaluation and internal convertibility) should precede or follow demonopolisation.”*

(Kaser, 1990, p. 610). His arguments are based on empirical analysis of economic reform in Poland in which, to some extent, the government had little choice – macro stabilisation was so important given the pre-existing state of hyperinflation that market liberalisation and trade liberalisation in particular were likely to act far more quickly than demonopolisation, which may take many years. In contrast, for Hungary, Hare (1990) preferred domestic liberalisation to trade liberalisation. He pointed out that higher prices relative to wages (achieved by shifting market power from labour to the monopoly firms) should reduce excess demand, and higher profits will allow investment to be restructured in line with market demand, rather than bureaucratic preference. Immediate trade liberalisation would, according to Hare, imply a large increase in both imports and unemployment which would generate “*strong and possibly irresistible political pressures to stop the reform process and re-impose central controls*” (Hare 1990, p. 593).

The second issue in the sequencing debate is privatisation. Blanchard et.al. (1991), Lipton and Sachs (1990) gave priority to stabilisation and privatisation over restructuring the economy at the start of the transformation program. They also argued that marketisation and privatisation should be simultaneous and rapid in order to create proper motivations and incentives to support the market economy. The main arguments for immediate privatisation, if necessary before the other components of the reform, are based on the need to make the reform process irreversible. “*Until privatisation has been accomplished, the economic crisis is likely to persist*” (Åslund, 1991, p. 30). Åslund also suggests that privatisation will solve all the problems of transformation and lead to robust economic growth. To support this idea, Blanchard, et al. (1991) suggested that the state-owned enterprises should be given away rather than sold. The reason for this, it is argued, is that if firms are to be sold off quickly, before the reform process has established a rational and competitive set of prices which may be used to value the firm, and before property rights legislation is clearly established, then there is great danger that insiders or incumbent management will obtain control of many firms.

In contrast the main argument against rapid privatisation is that although state enterprise debt is regarded as one of the most difficult economic problems in many transition economies, however, privatisation is not a solution to the enterprise debt crisis. As argued by Köves (1992), inefficient management is an inherited problem rooted in the economic and political environment in which SOEs long had to exist. The quality of management has tended to adapt to changes in the economic policies of the respective regimes. As economic liberalisation has progressed, the management of SOEs has become more business-oriented. It is unreasonable to expect that privatisation by itself will produce capitalist-type managers. In addition, from the practical experiences in many transition countries with weak institutions, privatisation's promise has not been fulfilled. Some therefore argue that the best course of action for such countries is to postpone further privatisation until competitive forces and an enabling institutional/governmental framework are in place (Nellis, 1999).

The third debated issue relates to banking and financial reforms. Though such reforms belong to the phase of structural transformation, the standard instruments of monetary and fiscal stabilisation require a two-tier banking system, which would allow the Central Bank to influence the monetary creation by the commercial banks through an interest rate policy. They also require a well-functioning, modern tax system. If the budget deficit is to be reduced, not only must expenditure be cut but also tax collection must be improved (Calvo and Frenkel, 1991). But if this is indeed a precondition to successful stabilisation, a full banking and tax reform might take too much time in view of the urgent needs of stabilisation (Lavigne, 1995)

2.3.3 Speed of reform - “Big Bang” vs. “Gradualism”

There was never much doubt about what had to be done: macroeconomic stabilisation and controlling inflation, control over budget deficits, price liberalisation, adoption of a single exchange rate, current account convertibility, opening to trade and capital movements, building up banking and financial systems, establishing property rights, ending

soft-budget constraints, and setting up market-based welfare systems. Nevertheless, one of the big disputes about the transition to a market economy concerns how fast it can, or should, be undertaken, and in what order various reform measures should be carried out. Although the discussion has been wide-ranging the consensus focuses on two approaches, namely “Big Bang” or “shock therapy” and “Gradualism” approaches. Woo (1994) characterises “Big Bang” as consisting of four actions which must be implemented either simultaneously or in quick succession. These four actions are (i) almost complete price liberalisation, (ii) liberalisation of the trade sector by a currency devaluation (to the black market level) and abolition of trade barriers, (iii) legalisation of private economic activities and the announcement of plans to privatise SOEs and (iv) adoption of non-inflationary macroeconomic policies. In general, for many economists the “Big Bang” approach means that moving to markets from a centrally planned economic system can only be done in one go. Of course the usual lags such as design, decision and implementation imply that the strategy cannot be enacted literally in one day, but the proponents of “Big Bang” insisted that fast-moving is highly desirable (Wyplosz, 1999). In contrast, the proponents of a gradual approach have argued that not only is it impossible to do everything at once, but that it is highly undesirable. The gradualists have proposed instead a sequencing of policy measures, which means that changes will be spread over time to prevent economic disruption, such as inflation and unemployment which are certain to occur when the “Big Bang” approach is used. An example would be the gradual lifting of state price control over basic consumer goods and services, such as food and housing. Once one reform is consolidated and in place, another reform begins.

Arguments advanced by Lipton and Sachs (1990), Kornai (1990), Fischer and Frenkel (1992), Blanchard et.al (1991), Balcerowicz (1994), Åslund, Boone and Johnson (1996), and many others, favoured a swift transition, convinced that the conditions for long-term stabilisation and systemic transformation could be established only at the cost of a serious short-term recession and decline in living standards. The decision to start along many fronts simultaneously reflected a belief that the components of reform were

interlinked and complementary, so that partial reforms would lead to unsatisfactory outcomes. From their opinions, to be fully effective, most measures needed each other. For example, restoring the price mechanism is only useful if firms face hard budget constraints, which in turn requires clear property rights and an ability to uphold them. This in turn calls for the phasing out of state subsidies. The emergence of potentially profitable firms requires the establishment of a financial system. Necessarily, then, monetary policy has to be shifted to controlling the money supply, which is impossible unless the budget is brought under control. In short, to succeed, macroeconomic stabilisation and structural reforms need each other, and each other part strengthens the whole (Wyplosz, 1999). They were also certain that gradualism would not be successful because the commitment to change is in doubt, the expectation is that policy will be reversed and the needed behavioural responses are therefore not forthcoming.

Proponents of shock therapy or “Big Bang” strongly emphasise stabilisation and liberalisation. Regarding stabilisation, they stress the necessity of a restrictive monetary and fiscal policy in order to combat budget deficits and external disequilibria (Berg and Sachs, 1992, Lipton and Sachs 1990). The core element of a shock therapy, however, is rapid elimination of domestic price control by the state. Price liberalisation is essential for macroeconomic stabilisation and for microeconomic restructuring. A general increase in the price level has to eliminate the monetary overhang, while changing relative prices will improve allocative efficiency. Producers will economise on the utilisation of inputs, while consumers are expected to experience welfare gains because no longer will they be forced to substitute initially unwanted for eventually unavailable commodities (Brada, 1993). The therapists (who support the “Big Bang” approach) also have supported the idea that liberalisation of the domestic market must be taken through both the freeing of prices and the liberalisation of international trade simultaneously.

Proponents of the “Big Bang” approach accept that the transition from a command economy to a market economy will involve a great deal of pain, as, for example, the SOEs are dismantled. Inevitably there will be large-scale unemployment as the largely

underutilised labour force is disgorged on to the labour market. It is unlikely that private sector activity, while it is in its embryonic stage, will grow sufficiently rapidly to enable a smooth transition to take place. As a result there will be losers in the system, and, it was felt, the sooner the transition is completed the shorter the period of pain (Lipton and Sachs, 1990)

The case for gradualism is usually made on the grounds that a fixed cost of adjustment is spread over a longer period of time, thereby reducing its short-run cost. Arguments against a quick transition tend to emphasize the dangers of massive unemployment and that the restructuring is a process that takes time (McKinnon, 1991; Nuti and Portes, 1993). Another argument for gradual change is that without it social costs will become excessive, and it is impossible to undertake such massive changes very fast because society and humans need time to adapt to a new structure and learn how to manage it. In line with this issue, Murrell (1990) referred to Schumpeter's evolutionary economics and suggested that economic institutions must develop organically and cannot be transplanted. According to this view creating effective institutions is a lengthy process requiring much trial-and-error, implying that reform should occur in an evolutionary manner that adapts existing institutions to new needs pragmatically and gradually as has occurred in China.

If Woo's (1994) four characteristics of the "Big Bang" is recalled, then gradualism basically denies that they are essential to the transition process based on China's experiences. First, price reform does not have to be complete or rapid. For example, a dual price system existed for many years. Second, gradualists do not regard privatisation of SOEs as essential to improving their performance. Increasing competition may be important for increasing efficiency and reducing costs, but privatisation by itself is necessary but not sufficient. Third, gradualists argue that the problem facing the transition economies is one of structural imbalance and the absence of proper incentives, rather than macroeconomic imbalance that needs to be corrected by a massive reduction in aggregate demand. Indeed, they argue that the macroeconomic stabilisation measures aimed at

reducing aggregate demand, is likely to do more harm than good. Proponents of gradualism also argue that suddenly subjecting the whole of the domestic economy to international competition could put the domestic firms in a vulnerable situation (Pyle, 1997). However, gradualism presents some problems, mainly in relation to the question of optimal sequencing. Sequencing concerns whether microeconomic reforms should precede macroeconomic reforms or vice versa, agricultural reforms should precede industrial reforms, which should precede financial reforms and so on. Another issue in sequencing is whether economic liberalisation should precede political liberalisation. In Eastern European countries political liberalisation has taken place at the same time as economic reform, while in China (and Vietnam also) political reform has never been on the agenda.

Debates about the speed of reforms are currently much less acute than before. Both shock therapists and gradualists admit the need now for macroeconomic stabilisation first, and after most prices were deregulated and macro stability ensured, the remaining reforms, structural and institutional, by their very nature can be only gradual.

2.4 Economic Progress after a Decade of Transformation

Economic performance among the transition economies has differed widely during the last decade (1990-2000). The clearest differences are between the East Asian countries, China and Vietnam, and the countries of the CEE and CIS. China and Vietnam have contained inflation and benefited from continued high growth in GDP since the beginning of their reforms, while all CEE and CIS countries have experienced large output declines, and most have experienced hyperinflation. But even among the CEE and CIS countries, there are marked differences. Some countries lost over half of their GDP and growth performance in a number of countries is still poor, while others are growing strongly. Some are still suffering from high inflation while others have successfully reduced annual inflation to 50 per cent or less. It is argued that the countries that have done best are those who pursued their reform agendas most consistently, and they are also those who seemed

from the start most committed to reform. By and large they are the countries closest to the dynamic economic regions in Europe and Asia (Fischer and Sahay, 2000).

This subsection continues by first summarising the macroeconomic performance of the transition economies over the last decade, and accounting for the widely differing outcomes between them. What are the main determinants of this divergence of outcomes across transition economies is analysed thereafter.

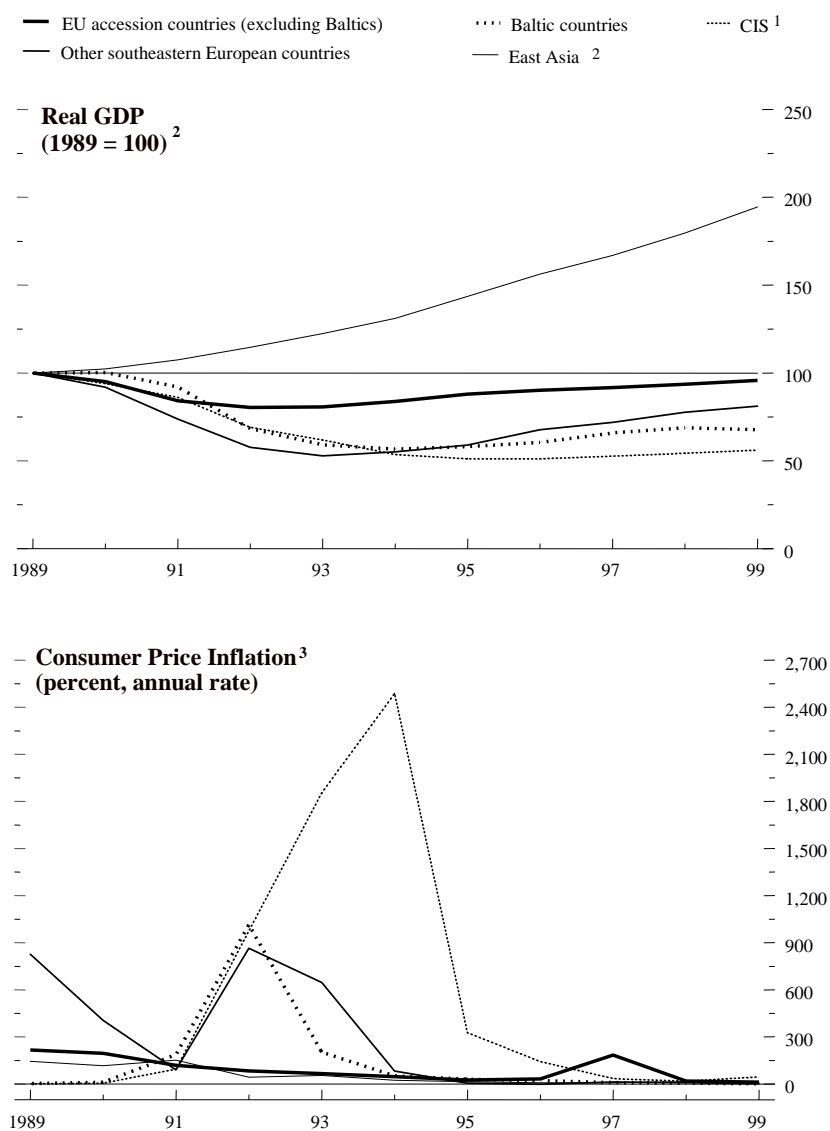
2.4.1 Macroeconomic performance

Macroeconomic development during the transition process, as reflected in output levels and rates of inflation, are summarised in Figure 2.2 for five country groups⁵.

⁵ In this, the data are adjusted for the East Asian countries whose transition began prior to 1989. The first 11 years of transition for these countries cover the following periods: China (1978-98), Lao PDR (1986-97), and Vietnam (1986-97).

Figure 2-2: Output and Inflation Performance During Transition

The evolution of output and inflation during the transition has differed considerably among countries.



¹Data include Mongolia.

²Chart is adjusted for three East Asian countries whose transitions began prior to 1989.

The first 11 years of transition for the following countries are as follows: China (1978–89), Lao P.D.R. (1986–97), and Vietnam (1986–97).

³The increase in the EU accession group's inflation, in 1997, is largely accounted for by the hyperinflation experienced in Bulgaria that year.

Source: IMF, *World Economic Outlook* 2000.

The European and CIS transition economies suffered a substantial output contraction at the start of the transition. The decline was particularly severe in the CIS countries, where the recovery process also started later and was less vigorous. The Baltic countries' performance was initially similar to that of the CIS countries, but since the mid-1990s they are well on their way towards joining other EU accession countries. The performance of other countries in southeastern Europe and some CIS countries in central Asia has been erratic because of civil strife and war. In contrast, output growth remained very strong in the transition countries of East Asia following the onset of reforms; it continued to increase throughout the transition period, and the output level is now almost double that compared to the starting level in these countries.

In most transition countries prices increased substantially during the initial stage of the transition, as a result of price liberalisation and the large monetary overhang inherited from the period under central planning (Figure 2.2, low panel). The increase in inflation, which reached four digit rates in the mid 1990s in a number of CIS countries, was attributed to the monetisation of large budget deficits, arising from output contraction and fiscal restructuring. However, by 1999 inflation rates were reduced to single digits in most countries. It is argued that inflation stabilisation is one of the major successes of the transition process (Fisher and Sahay, 2000), especially compared with countries in Latin America.

Both EU accession and CIS countries started the transition with a much larger industrial sector and a much smaller service sector than market economies with comparable per capita incomes, while China and Vietnam started with a large agricultural sector. During the transition, the excessive industrialisation that characterised all but the transition countries of East Asia has been reduced, as is evident from the falling share of industrial output in total GDP (see Table 2.4) in all but the East Asian transition economies. This was partly a result of a rapid expansion – in both absolute and relative terms – of the service sector, which had been severely neglected under central planning.

Table 2-4: Composition of Output in the Transition Country Groups

Regions and periods	<i>Percentage of GDP</i>		
	Agriculture	Industry	Services
EU accession countries			
1990-91	13.7	45.1	41.2
1997-98	13.9	33.0	53.1
CIS			
1990-91	27.5	39.7	32.8
1997-98	18.7	31.2	50.1
China			
1990-91	25.5	42.1	32.4
1998-99	15.9	50.9	33.2
Vietnam			
1990-91	40.2	22.6	37.2
1998-99	23.8	34.3	41.9

Source: World Bank country office data.

The public sector dominance in economic activity was replaced by a remarkable pick up in, and transfer of resources to, private sector activity: the private sector share of GDP rose to an average of 70 per cent in the EU accession countries in 1999 and to 50 per cent in CIS countries (see Table 2.5). This adjustment was achieved via both privatisation of old SOEs and the emergence of new private firms and activities. The European Bank for Rural Development (EBRD) (2000) estimates that in 1999 the private sector produced over half of GDP in 20 of the 26 transition countries in Europe. Although privatisation generally enhanced firms' productivity, especially when hard budget constraints were imposed, in the transition economies, productivity in both new domestic firms and foreign-owned firms exceeded that in domestic privatised or public firms. This suggests that the process of enterprise restructuring remains incomplete (Djankov and Murrell, 2000).

Table 2-5: Private Sector Growth, 1990s

Countries	Percentage of GDP		
	1990	1994	1999
<i>EU accession countries</i>	11	50	68
Czech Republic	12	65	80
Estonia	10	55	75
Hungary	18	55	80
Romania	17	40	60
<i>CIS</i>	10	20	50
Armenia	12	40	60
Belarus	5	15	20
Russian Federation	5	50	70
<i>Asia</i>			
China	35	42	50
Vietnam	32	27	40

Sources: *EBRD* for EU accession and CIS countries; *Chinese Statistical Yearbook* for China; *UNDP* and *IMF* for Vietnam.

Ownership developments in the economies of East Asia show a diverging trend. In China, ownership has been diversifying substantially toward a wide variety of forms including that of collectives, joint ventures between state and foreign private enterprises, foreign funded enterprises and domestic private enterprises. The growth of the so-called non-state sector has been increasing rapidly since the initiation of economic reform, and is now larger than the share of the formal state sector in the country's GDP. On the other hand Vietnam was found by the World Bank to be the only country in this sample where the state sector's share had risen in the period 1990-1994, but many enterprises classified as state firms in this country are in fact joint ventures with private (mainly foreign) partners. Since 1999 the Vietnamese government has taken a series of actions, such as promulgating the new enterprise law, aimed at improving the investment climate for a more fair business environment to promote private sector development. Despite these recent developments, compared to China the private sector in Vietnam, which now accounts for about 40 per cent of GDP, still faces a number of remaining impediments. Its activity was still constrained by an entrenched bureaucracy, a non-transparent tax and regulatory framework, and an uneven playing field in terms of market access, foreign exchange and bank credit availability. While in China a change in leadership attitude has led to the explicit recognition of the

private sector as an important component of the economy, along with earlier steps in clarifying the legal framework, that has been seen as key in fostering the rapid expansion of the private sector, which accounted for 50 per cent of GDP in the period 1999-2000. If private farmers are included this figure is likely to be around 66 per cent.

Exports have also been the major engine of growth in transition economies. The European transition countries, which are more advanced in their recovery, have been more successful in increasing their exports and reorienting them to the industrial countries. Exports from countries with more open trade regimes, mostly in EU accession countries, declined less with the initial disintegration of the Soviet Union and CMEA and recovered faster, contributing more to overall output growth. By contrast, in most CIS countries, which stuck with state trading arrangements and still imposed significant export controls, OECD-oriented exports of manufactures have remained marginal and the contribution of exports to growth has been negligible, but there is a definite upward trend (see Table 2.6).

Trade policies in China and Vietnam have combined substantial liberalisation with active export promotion. State trading now covers only a few important products and represents a shrinking share of trade in both countries. Many exports have been liberalised completely, but imports remain subject to significant restrictions. Both countries have exempted exporters from import duties on their inputs and created favourable conditions for export-oriented foreign investment.

Table 2-6: Export Growth and Destination, 1990s

Countries	Real export growth	Share of exports to industrial countries	
	1993-98	1992-93	1998-99
<i>EU accession</i>	8.8	35.8	67.5
Albania	22.0	62.9	94.1
Bulgaria	4.3	55.1	59.0
Czech Republic	10.4	29.9	69.3
Estonia	10.8	25.9	71.3
Hungary	11.1	67.4	81.5
Macedonia, FYR	7.3	22.2	65.5
Poland	12.9	71.6	75.5
Romania	8.7	44.3	71.0
Slovak Republic	6.9	15.9	59.2
Slovenia	5.7	33.7	70.7
<i>CIS</i>	3.2	28.0	29.0
Armenia	-8.6	9.4	34.9
Azerbaijan ^a	14.0	4.2	20.0
Belarus	-3.2	15.3	11.0
Georgia ^a	10.3	2.3	25.9
Kazakhstan	3.4	43.8	29.6
Kyrgyz Republic	-2.4	24.7	44.0
Moldova	4.8	6.2	31.3
Russian Federation	4.7	59.3	49.4
Ukraine	5.8	18.1	23.3
<i>Asian</i>			
China ^b	8.3	43.7	54.6
Vietnam ^b	21.3	41.6	50.2

Note: a. 1995-98; b. 1991-2001.

Sources: World Bank and International Monetary Fund databases

Another important factor contributing to the recovery of output in the transition economies has been direct investment from abroad. These flows are important not only as a source of capital and new technology to modernise industries and extract natural resources, but also bring in improved managerial practices and as a signal of confidence in the transition to a market economy. During 1996-99 more than US\$70 billion in direct investment came to the European transition countries, most of it to the EU accession countries (see Table 2.7). In the CIS countries foreign direct investment was largely confined to the energy-rich countries, with Azerbaijan, Kazakhstan, and Russia receiving 75 per cent of the total. In the East Asian transition countries, China has achieved remarkable success in comparison to other developing countries, such as Vietnam, in attracting foreign direct investment. From virtually zero in 1981 the figure was raised to

US\$45.3 billion by 1997, representing a half of all foreign direct investment to developing countries. With the rapid growth of foreign investment in China, foreign-invested companies have become an increasingly important source of China's strong export performance. In 1998, exports by foreign-invested companies amounted to US\$64 billion, or about 40 per cent of China's total exports, up from 12 per cent in 1990. The rapid growth of foreign investment was a result of some deliberate policies of the Chinese government through the creation of special economic zones, the opening of coastal areas, and preferential tax treatment and access to foreign exchange for exporters.

Table 2-7: Main Recipients of Foreign Direct Investment, 1992-99

Countries	1992-95		1996-99	
	US\$ millions	Percentage of GDP	US\$ millions	Percentage of GDP
<i>EU accession</i>	21,091	0.5	50,558	3.3
Czech Republic	4,821	2.9	10,104	4.6
Estonia	647	3.9	1,050	5.2
Hungary	9,399	5.7	6,979	3.8
Poland	2,540	0.6	17,096	2.9
<i>CIS</i>	8,272	1.0	22,001	2.5
Azerbaijan	237	4.2	3,222	20.9
Kazakhstan	2,357	2.7	4,971	6.4
Russian Federation	3,965	0.3	8,412	0.7
Turkmenistan	427	3.5	334	3.0
<i>Asia</i>				
China	72,300	1.2	170,000	4.1
Vietnam	6,306 ^a	3.6	10,107	10.5

Note: Shares of GDP are period averages of medians for the group.

a. 1991-95

Sources: World Bank Report, 2002, Table 1.5, p.7 for EU accession and CIS countries; Ma (2000), Table 7.2, p. 122 for China; UNDP and World Bank staff estimates for Vietnam.

The transition process also had a major impact on poverty and income inequality. In all the transition countries many people have gained, and imports of high quality consumer goods have boomed. But the combination of falling output and rising income inequality has led to large increases in poverty. Some increase in inequality could be expected as a result of introducing market incentives and adjustment of relative prices to reflect scarcities. In the countries of the former Soviet Union (particularly the western CIS), the share of the population living in poverty rose to more than 40 percent as of 1998, up from around 10 per cent before the transition period (1987-1988) (see Figure 2.3). The recorded increase in

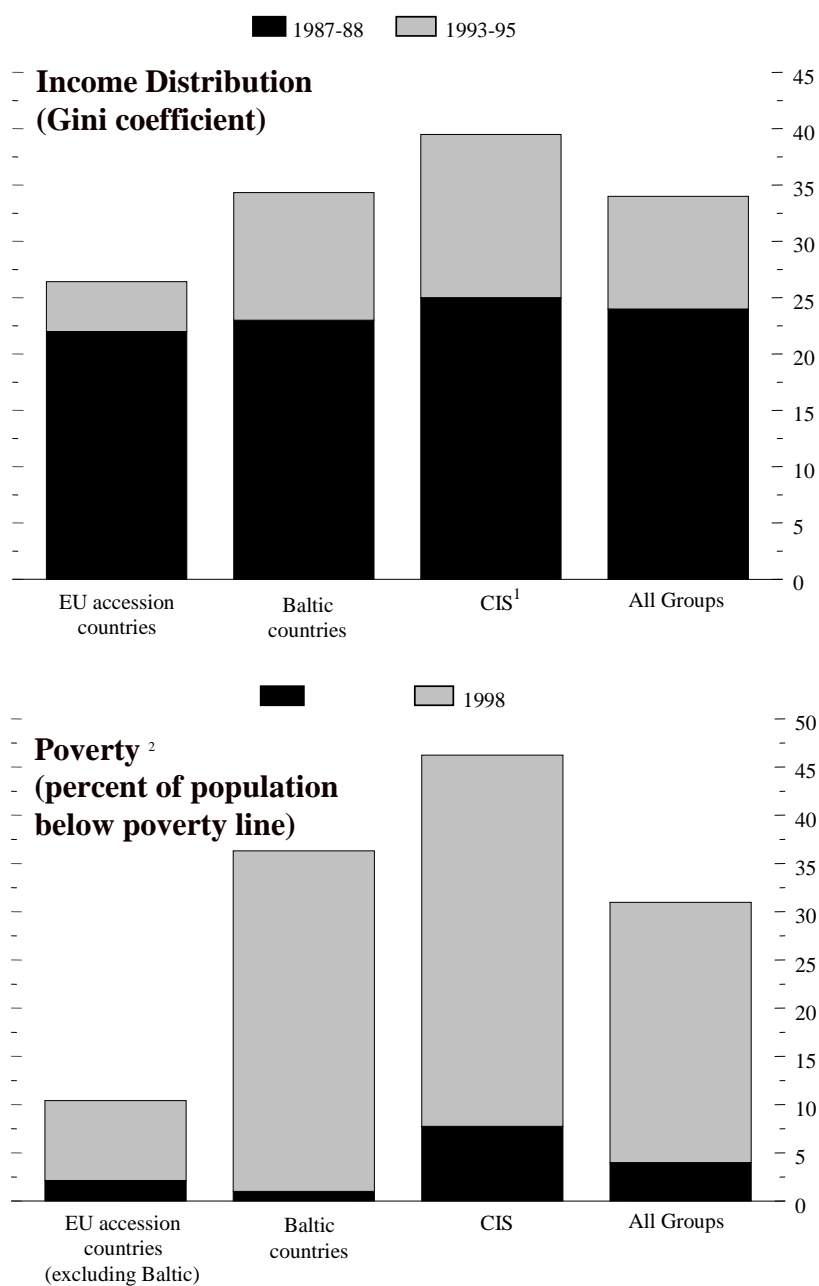
poverty was sharpest in those countries, as generally argued, where the reform process stalled, there was a deficiency in entrepreneurship and new growth opportunities, and where privatisation favoured insiders, and poor targeting of social safety nets permitted an uneven accumulation of wealth (World Economic Outlook, IMF 2000). Income inequality also increased in the transition economies of Asia, but, since output increased rapidly, these countries were still able to achieve impressive reductions in their poverty rates during the transition process. The initial phase of rural reform (1978-1984) in China led to both increased growth and reduced inequality, lifting 200 million people out of poverty. But after 1985, as reform centred on the industrial sector, inequality rose markedly, mainly because of increased urban-rural disparity, and the number of poor stopped falling. Rural poverty is a continuing problem. In Vietnam strong growth, due to the combined effects of land reform, stabilisation, and liberalisation, helped cut the share of the population in poverty in half over the past decade, some 30 million people, with around 37 percent of the population estimated to still live in poverty⁶.

⁶ This poverty incidence is measured according to internationally defined measures of poverty, as described in “Vietnam: Attacking Poverty” (World Bank Report, 1999). There are two poverty lines calculated on the basis of per capital expenditure – the overall poverty line and the food poverty line – that are used to calculate the number of people in a poverty situation. The poverty line in Vietnam for the year 1998 is as follows: food poverty: US\$92/per person/per year; overall poverty: US\$128/per person/per year.

Figure 2-3: Change in Poverty and Income Distribution

(Simple country averages for each group)

Except for the East Asian transition economies, the incidence of poverty rose in all countries during transition, and income distribution became more uneven.



Source: Branko Milanovic, *Income, Inequality and Poverty during the Transition from a Planned to Market Economy*, The World Bank Regional and Sectoral Series (Washington: World Bank, 1998).

Source: IMF, *World Economic Outlook 2000*.

¹ Data exclude Armenia, Azerbaijan, Georgia, and Tajikistan.

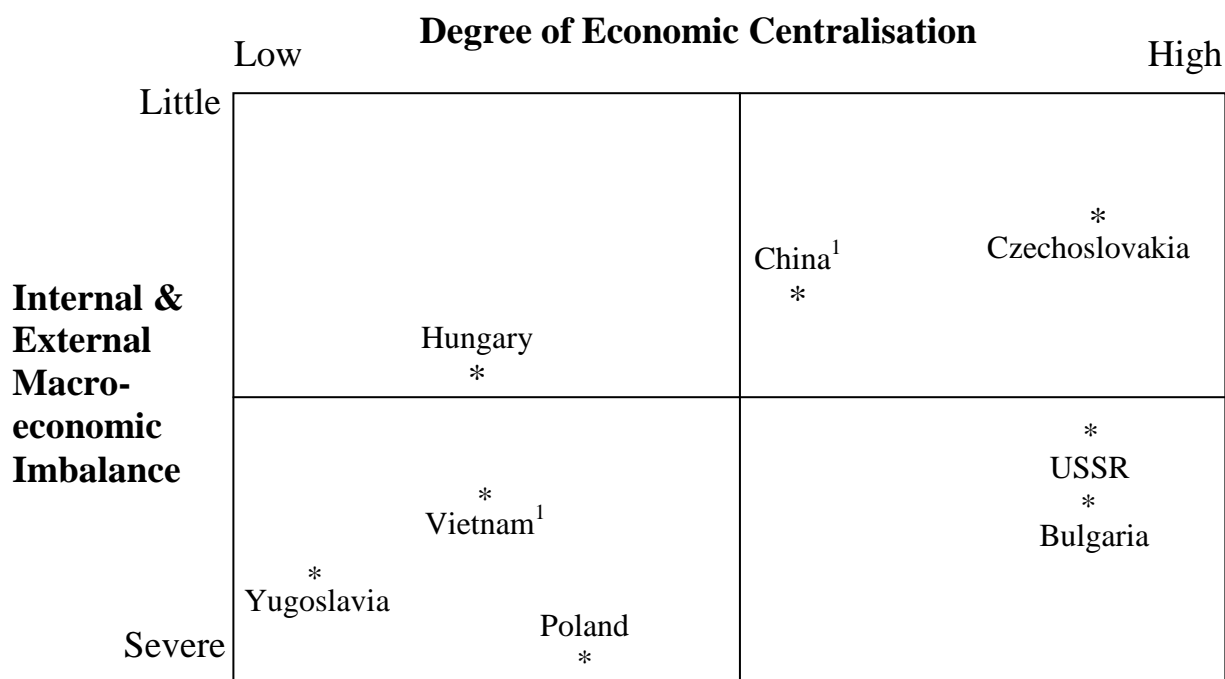
² Poverty is defined as having an income of less than four U.S. dollars per day in purchasing-power-parity terms.

2.4.2 Reasons for the variable performance in the transition economies

The divergent economic performance in the transition economies can be explained in terms of four main factors: (i) differences in initial conditions including geography (such as endowment of natural resources and the proximity to Western markets), years spent under planning, and the nature of economic development under socialism (such as the extent of overindustrialisation, military output, and repressed inflation); (ii) external economic shocks such as regional economic crisis, war and civil strife; (iii) reform policies and strategies; and (iv) speed of reforms.

According to Fischer and Gelb (1991), two economic differences distinguish the countries embarking upon a process of economic reform. They are the degree of economic centralisation and the degree of internal and external macroeconomic balance. Figure 2.4, which is taken from the above article, presented the initial conditions faced by some East European countries, China and Vietnam⁷ at the commencement of reform. Czechoslovakia and Hungary were close to macroeconomic equilibrium and could therefore concentrate on the structural reforms required for the transition to a market economy. In contrast, for countries facing severe macroeconomic imbalance such as Poland and the former Soviet Union, macroeconomic stabilisation would appear to be the immediate task. This policy could be needed for the case of Vietnam, which started the transition process in the mid-1980s with a relatively severe macroeconomic imbalance and high inflation. However, for China, the country started off with macroeconomic balance but experienced a high degree of economic centralisation, with structural reform being required to maintain macroeconomic stability.

⁷ China and Vietnam are added by the author based on the research of their initial conditions.

Figure 2-4: Initial Conditions for Transitional Reform

Source: Fischer and Gelb (1991), p. 69.

¹ Added by author.

Recently, in testing for the influence of initial conditions on the economic performance of transition economies, de Melo, Denizer, and Gelb (1997) calculated a set of 12 indicators including initial income, urbanisation, natural resource endowment, location, pre-transition reforms, initial repressed inflation, overindustrialisation, share of trade with the CMEA, black market rate for foreign exchange rate, new versus old states, and years under planning. The authors estimate a model where growth (in 1992-1995) is explained by initial conditions, policy reforms (measured by the aggregate Liberalisation Index developed in de Melo, Denizer and Gelb (1996a)). Their finding is that both initial conditions and the Liberalisation Index are quite significant in the growth equation. Based on these same indicators, the World Bank Report (2002) aggregates the initial conditions of the transition economies into three categories: structure, distortions and institutions⁸. Such

⁸ *Structure* encompasses such variables as the share of industry in GDP, the degree of urbanisation, the share of trade with the socialist block, the richness of the natural resource endowment, and the initial income. *Distortions* in the economy refer to such factors as repressed inflation, black market exchange

unbundling of initial conditions is used in the statistical analysis which can provide a clearer answer to the question of the importance of initial conditions versus policy reforms in explaining the recession and recovery periods of the transition experience. Three conclusions on the importance of these initial conditions from this Report are as follows.

First, initial conditions are more important factors in explaining the difference across countries during the initial period of output decline (1990-94) than over the full 10 years of transition. The three aggregate indicators of initial conditions defined earlier explain 51 per cent of the variation in the average rate of growth across countries during 1990-94, but only 41 per cent of the variance in average growth during the decade.

Second, the different types of initial conditions were more significant in the early and later stages of transition. Initial distortions in the economy are most closely associated with lower performance during the first years of transition, while initial institutions are more strongly associated with variations in subsequent performance.

Third, while initial conditions have a greater impact on the initial collapse of output than on the subsequent recovery, the impact of policies becomes stronger as the transition progresses. Indeed, policy variables are statistically significant in both periods, implying that market-oriented policy reforms not only speed economic recovery and promote growth in the medium term, but also mitigate the effects of the transition recession in the short term.

In the case of the Asian transition economies it has been suggested that conditions at the outset of the transition process may have been less adverse than in the European transition economies, they were not encumbered with a large SOE sector and with excessive resources in industries, and hence permitted an easier approach to market-based systems. Kalra and Sløk (1999) argued that there are several favourable conditions that can be explained for the strong output growth in the Asian transition economies during the

rates, trade shocks arising from the dissolution of the Soviet Union, the extent of prior economic reform within the centrally planned system, and the degree of economic stagnation prior to the transition. *Institutions* encompass such variables as years under central planning, location in relation to Western markets, and experience with nationhood.

disinflation period, which was in sharp contrast to the European transition experience. First, these countries have a more settled political situation, so that institution building could focus on the economic domain without also having to weave a new political fabric. Reforms in China and Vietnam were triggered without the collapse of the political structures. Second, both inherited a relatively large size of the agricultural sectors, and the availability of large rural labour surpluses has facilitated a natural acceleration of growth without a large dismantling of the overindustrialised state-owned enterprises as in their counterparts in Europe. In China, agriculture accounted for about 40 per cent of GDP in the late 1970s, and employed 70 per cent of the economically active population. The share of agriculture in output in Vietnam was even higher. Transfer of labour from agriculture to manufacturing, particularly in China during the 1980s, led to substantial gains in productivity and income growth. Third, these countries were less integrated with the CMEA system (however, compared to China, Vietnam was more dependent on this system), which provided these economies a cushion against the large external shock associated with the collapse of the Soviet Union. Finally, the Asian transition countries were under central planning only for a short time and there was a collective memory of market-oriented system, particularly in South Vietnam. In Vietnam, a significant non-state sector continued to exist, with about 40 per cent of industrial production and a large part of the service sector remained in private hands. Moreover, agriculture in the south of Vietnam had never been fully collectivised. However, not all initial conditions in the Asian transition economies were favourable. The heavy dominance of agriculture means low per capita income levels, extreme poverty, rudimentary infrastructure, and weak administrative capacity. There is also huge potential for productivity gains if workers can be transferred into manufacturing.

The second factor that contributed to delayed economic recovery in the transition period is external economic shocks. The collapse of the institutional and technological links of the Soviet centrally planned system disrupted the supply of inputs for production and the delivery of outputs, posing new challenges for enterprises. The loss of budget transfers from the centre and the elimination of subsidised energy imports were severe blows,

particularly to some of the newly independent states of the CIS. The various financial crises of the 1990s – Mexico, Russia, and East Asia – also contributed to delaying or interrupting the recovery of output. War and civil strife in some countries such as Armenia, Azerbaijan, Tajikistan and others took a major toll on lives, infrastructure, and the state, undermining the political consensus on reforms needed for successful transition.

The empirical evidence shows that the impact of initial conditions faded gradually over time: the macroeconomic performance at the beginning of the transition process was heavily influenced by the initial conditions, but the subsequent path of recovery was closely associated with the strength of the reform efforts. There are some empirical analyses which have largely focused on the third factor: effects of reform strategies and policies. A number of papers, Balcerowicz and Gelb (1994), de Melo, Denizer and Gelb (1996a), and Fischer, Sahay and Vegh (1996a,b and 1998) and Denizer (1997), have emphasised the variability in policies and performance, and have shown that government policies were key determinants of cross-country variation in growth and inflation. This analysis shows that economies in CEE and CIS countries contracted strongly as major reforms were initiated, but mostly resumed growth about two years later after achieving price stability. This analysis also shows that delaying reforms does not prevent output declines, and success in controlling inflation has been positively related to reforms.

Most recent studies of the impact of reforms on growth in transition economies use average reform indices developed by the World Bank and the EBRD. Havrylyshyn and van Roden (1999) show that economic liberalisation has a more significant impact on economic performance than measures of the quality of the institutional environment, although the latter's importance is increasing over time. Fischer and Sahay (2000) show that average growth over the first decade of transition is best explained by the EBRD's liberalisation and small-scale privatisation indices, whereas Stiglitz (1999) found out that growth is positively influenced by progress in privatisation only if there has been an associated improvement in governance.

Other papers in the literature find that there have been close links between political transition and intensity of reforms. Balcerowicz and Gelb (1994), de Melo, Denizer and Gelb (1996a), and Åslund, Boone, and Johnson (1996) show that economic reforms have been easier in countries where rapid and fundamental political changes have taken place.

It has been difficult, however, to accommodate the experience of some East Asian countries within the framework of a number of transition countries in the CEE and CIS. China and Vietnam initiated and implemented their economic reform efforts in a relatively stable political climate, without the disruptive effects associated with civil strife or the dissolution of state structures. Initial conditions - for instance, permitting greater private sector activity in agriculture and relaxing entry into industry in rural areas - have often been referred to as the primary causes of growth (Sachs and Woo, 1997). Several other studies have realized the role of initial conditions in shaping Asia's reform strategy. Thomas and Wang argue, "*countries with relatively stable political and macroeconomic conditions usually feel no particular urgency to reform, so they can afford to conduct reforms in an evolutionary fashion, rather than risk political and economic chaos*" and "*China and most East Asian countries belong to this group*" (Thomas and Wang, 1997, p. 223).

Another explanation provided for the phenomenon of the variable performance experienced by transition economies during the last decade includes attempts to model the impact of gradual, piecemeal reforms and the impact of shock therapy type measures. For therapists, if the weakening state is not able to enforce production quotas under the system of dual pricing, transfer of resources to the private sector with market prices creates bottlenecks and shortages in the state sector, resulting in the fall of total output (Murphy, Shleifer and Vishny, 1992). For gradualists, they believed that the institutional vacuum resulting from the elimination of old regulations and institutions before the new ones are created may have a devastating impact on output. In particular, they believed that the Chinese strategy, which relied on the rapid growth of newly created private businesses, is superior to large scale privatisation, since property rights in this case can be better

preserved and enforced. There were also a number of models showing that, under particular assumptions, slow liberalisation may be preferable to the “Big Bang” approach. For example, Friedman and Johnson (1996) argued that in the presence of complementarities between government policies and enterprise attributes and convex adjustment costs for enterprises (i.e. costs increasing with the speed of reforms), radical “Big Bang” reforms might not necessarily be optimal. It has been argued (Li, 1996) that in the absence of competitive product markets (monopolisation) at the outset of the reforms, shock therapy can only lead to the reduction of output while incremental reforms, such as the Chinese type dual track pricing system forcing enterprises to meet production quotas but allowing them to sell above-the-plan output at market prices, may contribute to the expansion of output. It was also argued that if state firms are allowed to choose between market and centrally planned prices (for both – inputs and outputs), then not only is Pareto optimality guaranteed at the end of the process, but also – with the appropriate state allocation of cheap resources and production quotas – it could be ensured that at every stage of the transition process no one is going to be worse off and at least someone is constantly made better off (Qian, Roland and Lau, 1997). Roland and Verdier (1994) showed that investment and output may fall as a result of immediate price deregulation due to the need to find new partners, and that under gradual dual track price liberalisation it is possible to avoid this effect. This argument is supported by some empirical evidence from China, Hungary and Uzbekistan as well.

2.5 Conclusions

The collapse of planned socialism in Central and Eastern Europe in the late 1980s was attributed to the structural weakness of central planning in improving the standards of living of the population. The centrally planned economies, characterised by obsolete and uncompetitive productive capacities, macroeconomic imbalances, lack of modern infrastructure and factor markets, and weak institutions, could not last forever and required change to another form of economy – a market economy - that could improve their current

situation. However, there is no simple or singular path for the successful economic transition from a planned to market economy. A number of key policy areas can be identified, including that of macroeconomic stabilisation, price and market reform, restructuring and privatisation and the need to redefine the role of the state. While there is general agreement on these basic measures, major disagreement relates to the speed and sequencing of such reforms. During the first years of the transition process, the “Big Bang” approach was favoured by many economists and policy makers in Europe. In reality, however, it was primarily limited to the implementation of a rapid macroeconomic stabilisation program, with the process of restructuring the economy, including that of privatisation, and the development of institutions required in the context of a market taking a much longer period of time to achieve – gradual approach.

There has been considerable variation in the economic performance of the transition economies since the beginning of economic transition. For the CEE and CIS countries the initial part of the process has been characterised by reduced production as well as a temporary, in most cases, dramatic increase in inflation. The extent and consistency of macroeconomic development policies have been pointed out as the main causes for the difference between each country’s performance, along with other factors such as their initial conditions, geography, history and culture.

This review, however, shows that the East Asian economies of China and Vietnam have performed remarkably differently during their process of economic reform. Neither suffered the declines in GDP growth, nor the significant increases in inflation. Such progress, which, arguably, has been attributed to these countries’ specific economic structures, geographic position, and the economic stabilisation policies implemented, will be comprehensively investigated in the next chapter for the case of Vietnam.

CHAPTER 3

THE ECONOMY OF VIETNAM

3.1 Introduction

This chapter endeavours to provide an investigation of the economic reforms which have been implemented in the Vietnamese economy since its reunification in 1976. Particular attention is given to the period of transition from a centrally planned economy to a market economy (1986 – present). This period has witnessed a significant macroeconomic adjustment, which can be categorised into two groups – stabilisation policies and structural reforms. While stabilisation policies aim at eliminating macroeconomic imbalances through demand adjustments, structural adjustment policies aim at raising output growth through policies that bring about major changes in the microeconomic structure by promoting competitiveness, efficiency and dynamism among the production units within the system.

The objective of this chapter is to distinguish how these adjustment policies are being used in Vietnam's macroeconomic system. The second section emphasises some of these issues for the period 1976-1985, which is described as a period of macroeconomic crisis, with a major deterioration of the economy, and also presents the initial economic reforms that the government applied in response to this crisis. The focus of the third section is to discuss the macroeconomic policies being applied since the *Doi Moi* (renovation) policy began in 1986, and present the major trends of the macroeconomic indicators which have been brought about by these policies. The fourth section discusses the major macroeconomic problems currently facing the Vietnamese economy, focusing on the interaction and interrelationship between the public and private sectors, savings and investment, import-substitution and export-oriented policies, and financial and banking reforms. The conclusion is summarised in the last section.

3.2 Vietnam's macroeconomic crisis 1976-1985

After national reunification in 1975 the Vietnamese leadership committed itself to pursuing a fundamentally socialist path, which was built on the basis of a socialist centrally planned model imported from the former Soviet Union and other socialist countries, for the whole united country. However, inexperience, ignorance in economic management of a modern economy, and, most importantly, deficiencies inherent in the economic model itself were important factors that soon led the economy into a serious economic crisis in the late 1970s and early 1980s. This period can be broken down into two sub-periods categorised by the framework of Five Year Plans (FYP). In the period of the Second FYP (1976-1980)⁹, Vietnam pursued a policy of socialist construction and development, with the so-called Democratic Republic of Vietnam (DRV) development model being applied to the whole country, with the task of strengthening socialist construction in the North and transforming the South's capitalist economy to a socialist one. During the period of the Third FYP (1980-1985) Vietnam went through a phase of economic crisis resulting from subjective and over-ambitious policies, a too-rapid economic reorganisation in the socialist direction in the South and major economic distortions in the North. The focus was placed upon relatively modest liberalisation of the economy initiated first in the agricultural and industrial sectors and then in the trade sector. Although some of the decentralisation measures in economic management that were introduced contributed to the recovery of Vietnam's economy, the goal of complete socialist transformation of the economy was still retained but a more gradual approach to it was adopted. At the end of this period, the emergence of severe macroeconomic imbalances, as reflected in high and rising inflation, prompted the government to accept more radical measures to reform the economy and Vietnam shifted to a new period - the period of transition from a centrally planned economy to a market-oriented one.

⁹ The First Five Year Plan applied when the country was at war with the US (1961-1965).

3.2.1 The premises of the Vietnamese macroeconomic crisis

Looking back at the performance of the Vietnamese economy after reunification in 1976 to 1985, what is most obvious is poor growth performance. The performance of Vietnam's economy during the Second FYP (1976-1980) failed to achieve its planned targets (Table 3.1 and 3.2). By most indicators the economy appeared to be continuously declining, and outcomes were much lower than the projected targets. Despite the improved performance of the economy over the period of the Third FYP (1981-1985), the economy confronted a number of problems at mid decade resulting in rising inflation that was stoked by food shortages and a rapid increase in the money supply.

In the Second FYP, which was presented at the Fourth Party Congress of the Communist Party of Vietnam (CPV) in December 1976, the development of agriculture was to be given the first priority, due to the urgent need to deal with food shortages and increasing unemployment created after the war. The emphasis on agricultural development was reflected in the allocation of a large amount of finance (US\$2.25 billion) to it, out of a total outlay of US\$7.5 billion earmarked for the plan (30% of the total). The priority was further demonstrated by the fact that a large portion of the 35 per cent of the budget which would go to industry, would be devoted to producing agriculture essentials. The performance of the agriculture sector in this period, however, was below expectations (Table 3.1). Food crops production declined from 13.5 million tonnes in 1976 to 12.6 million tonnes in 1977, contributing to a decline in agricultural output from 65.4 billion dong to 61.7 billion dong in real terms (Table 3.3). The situation became even worse when the value of agricultural output at constant 1982 prices further declined to 60.6 billion dong in 1978. During this period, agricultural output grew only 1.9 per cent per year, well below the population growth rate of 2.3 per cent and far behind the planned target growth rate for agriculture of 8-10 per cent per year.

Table 3-1: Gross Social Product (GSP) 1976-1985 (million dong)

	Second Five Year Plan										Third Five Year Plan									
	1976		1977		1978		1979		1980		1981		1982		1983		1984		1985	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
GSP at current prices	2696	100	2950	100	3424	100	3731	100	4281	100	10102	100	23915	100	32148	100	49728	100	135187	100
Agriculture	931	34.5	927	31.4	1155	33.7	1406	37.7	1761	41.1	4487	44.4	9916	41.5	12482	38.8	19056	38.3	50238	37.2
Industry	1036	38.4	1173	39.8	1351	39.4	1368	36.7	1413	33.1	3598	35.6	9182	38.4	12090	37.6	19083	38.4	55750	41.2
Construction	290	10.8	337	11.4	317	9.3	301	8.0	293	6.8	476	4.7	1220	5.1	1833	5.7	2729	5.5	9927	7.3
Others	439	16.3	513	17.4	601	17.6	656	17.6	814	19.0	1541	15.3	3597	15.0	5743	17.9	8860	17.8	19272	14.3
GSP at constant 1982 prices	206196	100	215349	100	224081	100	220287	100	218070	100	222310	100	239150	100	262230	100	288520	100	310390	100
Agriculture	80482	39.0	79609	37.0	78780	35.2	81014	36.8	87040	39.9	89980	40.5	99450	41.06	107770	41.1	113000	39.2	119420	38.5
Industry	80741	39.2	89166	41.4	97345	43.4	92447	42.0	84050	38.6	84910	38.2	91820	38.4	103590	39.5	117170	40.6	131180	42.3
Construction	14240	6.9	14365	6.7	14302	6.4	14270	6.5	14200	6.5	13770	6.2	12200	5.1	13880	5.3	15710	5.4	17260	5.6
Others	30733	14.9	32209	14.9	33654	15.0	32556	14.8	32780	15.0	33650	15.1	35680	14.9	36990	14.1	42640	14.8	42530	13.7
GSP by economic sector																				
State sector	76128	36.9	86512	40.2	95318	42.5	77350	35.1	77350	35.5	78320	35.2	79250	33.1	87100	33.2	101610	35.2	110920	35.7
Cooperatives	45398	22.0	46338	21.5	48048	21.5	54100	24.6	54100	24.8	56050	25.2	65110	27.2	74360	28.4	89500	31.0	109190	35.2
Private sector	84679	41.1	82449	38.3	80715	36.0	86620	39.3	86620	39.7	87940	39.6	94790	39.6	100700	38.4	97410	33.8	90280	29.1
Growth rate of GSP (%)	-		4.4		4.1		-1.7		-1.0		1.9		7.6		9.7		10.0		7.6	

Source: General Statistical Office, Statistical Data: Economics and Finance 1955-1986, Hanoi, 1988.

Table 3-2: Vietnam's Economic Performance: Projected and Actual GSP Growth Rate

	Projected	Actual
National Income		
Second Five Year Plan (1976-80)	13-14	0.4
Third Five Year Plan (1981-85)	4.5-5	6.4
Fourth Five Year Plan (1986-90)	8.0	4.3
Agricultural Production		
Second Five Year Plan (1976-80)	8-10	1.9
Third Five Year Plan (1981-85)	6-7	4.9
Fourth Five Year Plan (1986-90)	6.2	1.4
Industrial Production		
Second Five Year Plan (1976-80)	16-18	0.6
Third Five Year Plan (1981-85)	4.5	9.5
Fourth Five Year Plan (1986-90)	9.0	5.6

Source: General Statistical Office of Vietnam.

Whereas the agricultural sector had shown a decline in its growth rate in the two years after reunification, the industrial sector in Vietnam experienced a high growth rate of 10.8 per cent and 8.2 per cent (in real terms) in 1977 and 1978 respectively (Table 3.3). This was attributable to the large aid provided in terms of capital stock from Western countries and China. From 1979, however, the real value of industrial output declined sharply from 78.3 billion dong in 1978 to 74.6 billion in 1979 and 66.9 billion in 1980, resulting in negative growth rates of –4.7 and –10.3 per cent respectively (Table 3.3).

Table 3-3: Agricultural and Industrial Production 1976-1985

	Agricultural Production			Industrial Production	
	Output	Growth rate	Food crops	Output	Growth rate
(1)	(2)	(3)	(4)	(5)	(6)
1976	65364	-	13.5	65344	-
1977	61722	-5.6	12.6	72399	10.8
1978	60597	-1.8	12.3	78300	8.2
1979	65847	8.7	14.0	74594	-4.7
1980	70804	7.5	14.4	66925	-10.3
1981	73899	4.4	15.0	67594	1.0
1982	82254	11.3	16.8	73463	8.7
1983	85001	3.3	17.0	83033	13.0
1984	89472	5.3	17.8	93952	13.2
1985	91045	1.8	18.2	105340	12.1

Note: (2) and (5) are calculated in million dong at 1982 prices; (3) and (6) are percentages; (4) is million tonnes.

Source: General Statistical Office, Statistical Data: Economics and Finance 1955-1986, Hanoi, 1988.

A worsening in agricultural production in the two years of 1977-1978 and a severe reduction in industrial production over the period 1978-1980 contributed to a small negative growth rate of the Gross Social Product (GSP) in 1979 and 1980. The growth rate of real GSP (at constant 1982 prices) slowed down from 4.4 per cent in 1977 to 4.1 per cent in 1978 (Table 3.1). The situation became even worse when real GSP fell successively in the next two years 1979 and 1980, from 224.1 billion dong in 1978 to 220.3 billion in 1979 and further to 218.1 billion in 1980 at constant prices. Besides the consequences of war, a very important reason for the poor economic performance was shortcomings in management and leadership. In agriculture, along with bad weather, agricultural production

was adversely affected by scarce investment and forced collectivisation. In industry, a combination of ambitious targets, poorly trained cadres, arbitrary management and shortages of incentives was blamed for the lack of improvement in productive capacity. The policy of nationalising industry and commerce in the South had a disastrous impact on industrial output and overall economic activity. Thus, in spite of the Second FYP's emphasis on industrialisation, industrial output over the plan period hardly grew at all.

The disastrous effects of attempting to collectivise agriculture and nationalise industry and commerce were further compounded by the failure of promised foreign assistance from Western countries and China to materialise. As early as June 1978 deterioration in the bilateral relations with China resulted in a termination of aid estimated at US\$900 million. With general condemnation and embargoes from the international community resulting from the retaliations for the invasion of Cambodia, the country lost a further US\$78.5 million in bilateral aid and US\$90 million in multilateral aid. General embargoes also meant a loss of access to international lending sources and a loss of important international markets. The loss was reflected by a sharp decline in the share of foreign loans and grants in total budget revenues from 60 per cent for the North, during the period 1971-75 on an annual average basis, to 32 per cent in 1978, while total budget revenue increased by only 8.6 per cent from 9.0 billion dong in 1977 to 9.8 billion in 1978 (Table 3.4). The dependence on foreign aid was further reflected by the share of imports of production input in total imports declining from 83.2 per cent in 1976 to 76.1 per cent in 1978 (Table 3.5). Fuel and raw materials were major components of imported production input, but their share in total imports declined sharply from 53.6 per cent in 1976 to 28.2 per cent in 1980. This meant a considerable cut in imported supplies which were much needed for the country's reconstruction after the war.

Table 3-4: Summary of State Budget Operations, 1976-1985 (billion dong)

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Total revenue	9.178	9.043	9.824	11.033	11.882	22.787	56.638	75.044	111.398	25.341
Domestic revenue	5.069	5.927	6.681	6.537	6.760	17.165	40.327	58.815	96.140	18.977
Tax revenue	0.676	0.686	0.733	0.771	1.278	2.837	7.300	13.436	19.140	3.058
Agriculture	0.234	0.230	0.283	0.292	0.443	0.605	2.489	3.172	4.338	0.679
External trade	0.010	0.002	0.008	0.001	0.007	0.197	0.339	1.096	2.353	0.439
Other non-agricultural taxes	0.432	0.454	0.442	0.478	0.828	2.035	4.472	9.168	12.449	1.940
Tax on industry and trade	0.432	0.454	0.442	0.478	0.828	2.035	4.472	9.168	12.449	1.940
Tax on housing and land	-	-	-	-	-	-	-	-	-	-
Income tax	-	-	-	-	-	-	-	-	-	-
Non-tax revenue	4.393	5.241	5.948	5.766	5.482	14.328	33.027	45.379	77.000	15.919
State enterprises	4.038	4.847	5.411	5.231	4.953	3.716	30.047	41.828	68.116	14.688
Other	0.355	0.394	0.537	0.535	0.529	10.612	2.980	3.551	8.884	1.231
Grants and aids	4.109	3.116	3.143	4.496	5.122	5.622	16.311	16.229	15.258	6.364
Total expenditure	9.413	9.179	10.099	11.545	12.003	26.915	61.233	77.999	115.448	34.610
Current expenditure	5.733	5.969	6.359	7.788	8.636	22.126	47.253	58.895	88.704	23.910
Capital expenditure	3.680	3.210	3.740	3.757	3.367	4.789	13.980	19.104	26.744	10.700
Interest	-	-	-	-	-	-	-	-	-	-
Overall balance	-0.235	-0.136	-0.275	-0.512	-0.121	-4.128	-4.595	-2.955	-4.050	-9.269
Financing	0.235	0.136	0.275	0.512	0.121	4.128	4.595	2.955	4.050	9.269

Source: General Statistical Office, Statistical Data: Economics and Finance 1955-1986, Hanoi, 1988.

Table 3-5: External Trade: 1976-1985 (Rouble-US\$ million)*

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Trade balance	-801.4	-895.5	-976.4	-1205.6	-975.6	-981	-945.6	-910.2	-1095.4	-1158.9
Total exports (fob)	222.7	322.5	326.8	320.5	338.6	401.2	526.6	616.5	649.6	698.5
Structure of exports (%)	100				100					100
Industrial goods	16.0	-	-	-	10.9	-	-	-	-	9.0
Handicrafts	38.7	-	-	-	47.4	-	-	-	-	33.7
Agriculture, Forestry and Marine	45.3	-	-	-	41.7	-	-	-	-	57.3
Total imports (cif)	1024.1	1218.4	1303.2	1526.1	1314.2	1382.2	1472.2	1526.7	1745.0	1857.4
Production inputs	852.5	932.4	991.2	111.6	998.8	1143.0	1267.3	1392.1	1532.1	1856.6
Consumer goods	171.6	286	312	414.5	315.4	239.2	204.9	134.6	212.9	270.8
Structure of imports (%)	100	100	100	100	100	100	100	100	100	100
Production inputs	83.2	76.5	76.1	72.8	76.0	82.7	86.1	91.2	87.8	85.4
Production packages	14.4	-	-	-	27.4	-	-	-	-	18.7
Machine and transport equipment	9.2	-	-	-	14.3	-	-	-	-	8.4
Spare parts and tools	6.0	-	-	-	6.0	-	-	-	-	5.9
Fuel and raw materials	53.6	-	-	-	28.2	-	-	-	-	48.4
Consumer goods	16.8	23.5	23.9	27.2	24.0	17.3	13.9	8.8	12.2	14.6
Terms of trade index (1987=1000)	137.8	131.0	139.8	138.3	151.1	148.3	118.4	115.9	114.2	105.9
Export price index (fob) (1987=100)	73.3	77.8	93.6	107.4	128.9	127.5	98.9	95.5	94.3	85.4
Import price index (cif) (1987=100)	53.2	59.4	67.0	77.7	85.3	86.0	83.6	82.4	82.6	80.6

Note: * Vietnamese official surveys measured foreign trade in “dollars-roubles”. To quote the official source: “For the socialist countries (area I), calculations are in roubles; for the capitalist and developing countries (area II), calculations are in US dollars. At present we do not yet have the means for converting the data into a single united currency” (SO 1987, p. 357).

Source: General Statistical Office, Statistical Data: Economics and Finance 1955-1986, Hanoi, 1988.

By the end of the 1970s the Vietnamese economy was on the brink of disaster, with real per capita income falling from an already intolerably low level. In response to the serious economic crisis caused by the failure of economic strategies adopted since reunification, the Sixth Plenum of the Fourth Party Congress (1979) presented a number of measures to repair the economy. The goal of complete socialist transformation of the economy was retained, but a more gradual approach to it was adopted. In addition to slowing the rate of socialist transformation, two market-oriented reforms were adopted. The first was the initiation of a “contract” system in agriculture, which set quotas for household units rather than for entire cooperatives and allowed households to retain and trade any output in excess of their quota. In effect, the cooperatives were reduced to a subsidiary role of allocating land, supplying inputs, and providing technical assistance. The response to this reform was a remarkable acceleration in agricultural output, which expanded by 4.9 per cent on an annual average basis over the plan period (Table 3.2). On average, rice output rose to 17 million tonnes a year, versus 13.35 million tonnes in the 1976-80 period.

The second major reform was directed at industry, giving state enterprises more autonomy in their production. The decree legalised other productive activities outside state obligations for the purpose of which enterprises were established in a so-called “three-plan system”¹⁰. At the same time various measures to increase incentives such as a payment system based on piecework rate, bonuses and monetary awards were applied. These measures contributed to the recovery in state industrial output over the Plan period, with industrial growth rising from an average of 0.6 per cent in the Second FYP to about 9.5 per cent in the Third FYP (Table 3.2). From falling in the two previous successive years, the value of industrial output continued to grow strongly in the last four years of the Plan. The growth rate increased sharply from 1 per cent in 1981 to 8.7 per cent in 1982, and

¹⁰ Under Plan One, the enterprises were provided with the inputs at subsidised prices and in turn were required to supply set quantities of goods to the state. Under Plan Two, the enterprises could produce beyond the amount specified in Plan One and use revenues to purchase additional inputs. Plan Three gave enterprises the right to engage in sideline activities more or less on a free market basis, which became known as the “fence-breaking” movement.

continued to increase in the two subsequent years of 1983 and 1984 to 13 per cent and 13.2 per cent respectively before slowing down to 12.1 per cent in 1985 (Table 3.1).

One spontaneous development in the aftermath of the Sixth Plenum was the creation of local export-import companies, the most important of them in Ho Chi Minh City. Hard currency earnings grew rapidly outside the direct control of the central authorities. One of the more positive points of the period is the development of exports, which showed an average growth of 15.6 per cent over the period 1980-81 compared with 1.6 per cent between 1977 and 1980. After 1981, growth slowed. Furthermore, erosion of the central state monopoly of foreign trade also had positive effects on state industry and agricultural cooperatives.

In spite of the positive responses to economic liberalisation in industry, agriculture and trade, there was the emergence of severe macroeconomic imbalance in the early 1980s, reflected in high and rising inflation. Inflation undermined the reform movement not only because it was a symptom of the failure of the reforms, but it also reduced the real wages of civil servants. The source of rising inflation in the early 1980s was the budget deficit of SOEs which, under the central planning system, were automatically financed by central bank credits. It is important to note that while financial deficits were inherent in the command economy system, the gradual market-oriented reforms only served to exacerbate the financial problems of SOEs (Riedel and Comer, 1997). The diversion of resources into sideline activities, while encouraging firms to respond to market signals they would otherwise have ignored, increased the operating deficits of SOEs under Plan One and allowed them to borrow more from the central bank than they would have otherwise. Thus, by 1985 the economy of Vietnam again found itself facing an economic crisis, reflected by rising inflation, food shortages and a rapid increase in the money supply. This prompted the government to accept even more radical measures to reform the economy.

3.2.2 *Doi Moi* - The renovation policy response to the crisis

In response to the immediate crisis, at the Sixth National Congress in December 1986 the decision to transform Vietnam into a market economy, albeit one with a “socialist orientation”, was taken. The slogan adopted for the economic reform program was “*Doi Moi*” (renovation) with the goal of transforming the economy gradually into a “socialist market economy” through step-by-step reforms. The objectives of the reforms were: (a) to develop the private sector; (b) to increase and stabilise agricultural output; (c) to shift the focus of investment from heavy to light industry; (d) to reduce the role of the SOEs; (e) to focus upon export-led growth, based upon the experience of Vietnam’s dynamic regional neighbours; and (f) to attract foreign direct investment, seen as essential for economic development.

The agricultural sector was initially a major focus when economic reforms began, because this sector had been heavily repressed under central planning and its liberalisation could have immediate payoffs. In agriculture the reform went beyond the contract system to confirm the household as the basic production unit, and to further limit the role of cooperatives. Farmers were no longer required to sell contracted amounts of output to the state, but instead could sell off their product in the market after paying taxes and commissions. In addition, in 1988, households were given land tenure for at least 15 years, and land was made transferable between farmers under certain circumstances. Thus, for all intents and purposes, the dominant sector of the Vietnamese economy was effectively privatised. As a result there was an immediate jump in farm output, and only a year later Vietnam started to export its rice and became the world’s third largest exporter after a long period in famine conditions.

Reforms also began in other areas of the economy, and had some initial successes. In the state industrial sector the system of state subsidies for enterprises was abolished, and capital ceased to be provided free to enterprises from the state. Enterprises were put on a self-financing basis and had to provide for their own capital needs through loans or savings.

These new regulations were also to give enterprises greater production autonomy. Since 1989 any remaining obligations for state-owned enterprises to deliver goods at low prices to the state were removed, and, with prices thereby usually set by negotiation between buyer and seller, the embryonic Vietnamese market economy emerged.

In the financial sector the monobank system was dismantled and the Vietnamese State Bank was established as the central bank. Under the reforms, a two-tier banking system was established, and the State Bank began gradually to devolve its banking functions to specialized banks and shift its role more to that of a modern central bank. The functions of the State Bank focus mainly on money issuance, management of money circulation, and control of the capital market.

Another early and important step in the *Doi Moi* program was the elimination of the state monopoly of foreign trade in 1988, allowing the establishment of Foreign Trade Organisations (FTOs) and permitting some firms to engage directly in international trade outside the FTOs. To improve the country's trade performance the dong was devalued in early 1988, narrowing the spread between the official and parallel market rates. In 1989 a new tariff schedule was introduced, while quotas on imports and exports were lowered. The monopoly held by the central state trading corporations was eliminated, when provincial and local authorities were allowed to establish competing foreign trade companies. Priority was to be given to the development of goods for export as one of the key programs in the structural adjustment of the economy, reflecting a new open-door economic policy. The objective of the policy was to induce capital and technology from foreign countries with a view to intensifying the use of domestic resources, mainly the labour force, and step-by-step integration of the Vietnamese economy with the world economy starting with other economies in the region.

In addition to freeing up international trade, another early step in the reform program was the liberalisation of foreign direct investment. At the end of 1987 the government promulgated the Law on Foreign Investment, which was considered to be one of the most liberal in South East Asia at that time. All sectors of the economy, in principle, were open

to foreign investors, although special incentives were attached to investments that promoted exports and generated hard currency earnings. Since the new foreign investment regulations came into effect, many investors from other countries have invested in all areas from industry, services to agriculture. However, the amounts were not substantial.

Compared with the periods before the *Doi Moi* policy was applied the economic achievement in this period was considerable. However, the economy was still suffering from severe macroeconomic imbalance arising from public sector deficits and retention of the planning apparatus and the dual (official vs. market) pricing system in industry. Prices again increased sharply causing hyperinflation at an annual rate of about 400 per cent in 1989. In early 1989, facing a macroeconomic crisis like the one encountered in 1986 as well as prospective declines in financial assistance from the USSR, the government decided to adopt a bold combination of structural reforms and orthodox stabilisation, with the latter including raising interest rates, restraining the growth of credit, and devaluing the exchange rate. These measures, together with the legalisation of gold trading, induced a strong portfolio adjustment by households in favour of dong assets and away from dollars and gold, which at the time were circulating widely in Vietnam (Dollar, 1993). The effect of these measures was to bring inflation to a virtual halt in mid-1989. Structural reform included the liberalisation of prices and the elimination of the system of state procurement.

While the pace of reform in Vietnam from 1986-89 was gradual, the stabilisation program adopted in 1989 was certainly as ambitious as anything described as “shock therapy” in other countries (Riedel and Comer, 1997). There can be no question that (1) privatising the dominant sector of the economy (agriculture); (2) decontrolling prices; (3) opening up the economy, all in matter of a few years, constituted a radical reform program. The outcome was, nevertheless, very different from that in Eastern Europe, where “Big Bang” describes the “big collapse” in output that followed major reforms. The analysis of the macroeconomic performance and reform policies since Vietnam transformed to a market economy will be conducted in the next sections.

3.3 The Effect of Reform Policies on Macroeconomic Performance since 1986

This section attempts to analyse the effects of the reform policies, applied since the decision to change course and transform Vietnam into a market-oriented economy was taken in 1986, on its macroeconomic performance. These reform policies can be classified into two kinds: macroeconomic stabilisation policies and structural adjustment policies. The macroeconomic stabilisation policies include: (a) fiscal policy; (b) monetary and credit policy; and (c) exchange rate adjustment. Structural adjustment policies contain: (a) agricultural and industrial policy reforms; (b) state-owned enterprise reforms; (c) trade policy reforms; (d) public sector reforms; (e) tariff reforms; and (f) factor market reforms – land reform, labour policy, financial sector reforms, etc. The effects of these policies on the macroeconomic performance in Vietnam can be usefully broken down into three periods: the first period from 1986 to 1989; the second period from 1990 to 1997; and the third period from 1998 until the present.

3.3.1 Period 1986 – 1989: Economic renovation

Following the *Doi Moi* policy Vietnam experienced a major increase in the growth of real GDP that was contributed primarily from agriculture and services. From Table 3.6 it can be seen that GDP growth increased dramatically from 3.4 per cent in 1986 to 8.0 per cent in 1989. For agriculture and services, similarly, substantial increases in growth rates were recorded, except for the year 1987 where a negative figure for agriculture resulted from bad weather. Radical changes in pricing and the management of agriculture in 1987-89, which greatly increased the freedom of producers and thereby stimulated impressive increases in agricultural production and particularly of rice, were the main factors that contributed to this growth. However, this period witnessed a decline in industrial production, largely due to the loss of aid and markets in COMECON countries which used to be the main suppliers of cheap required raw materials and spare parts to SOEs, and the

closure of many unprofitable enterprises when they were made subject to market determined-pricing principles. Surprisingly, consumer price inflation abated considerably in 1989 to 34.7 per cent from 487 per cent in 1986, arising from measures to bring monetary growth under control and to devalue the Vietnamese dong, as well as from the increased availability of products. A key part of the fight against inflation was a drastic increase in interest rates. During the year 1989 both borrowers and savers were confronted with a positive real interest rate, which was linked to the previous month's inflation plus a few per cent. This signified that the real rate of interest became almost ten per cent per month during the first half of 1989, when inflation decreased dramatically. Other price reforms complemented the interest adjustments. The government unified and devalued the exchange rate and legalised gold trading. As a consequence of these reforms, households shifted some portion of their liquid assets out of gold and dollars back into dong-denominated assets. Vietnamese households switched from saving in gold and dollars to saving in bank accounts, and a vast amount of liquidity was thereby absorbed. The velocity of money was greatly reduced and, as a result, inflation was under control.

Low recorded levels of domestic savings were a characteristic of the Vietnamese economy through the 1980s (Dollar, 1993), leading to a reliance on foreign savings to cover demand for consumption and accumulation. During this period the domestic savings ratio ranged between 2 per cent and minus 3 per cent. The proportion of total national income devoted to accumulation was also unstable. Accumulation peaked in 1988 owing to the *Doi Moi* program but decreased sharply in 1989. Spending cuts in the face of accelerating inflation badly affected state investment. State investment dropped by 64.5 per cent in 1987 and recovery was very slow. Investment data was only officially available for the state sector. The productive sector accounted for 85.6 per cent of state investment. Of the productive sector, the share of industry reached the level of 45 per cent. According to statistics, the structure of accumulation and investment did not change by much despite the move to a market economy.

Table 3-6: Real GDP and Sectoral Growth Rates

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Real GDP	3.4	4.0	5.2	8.0	5.1	6.0	8.6	8.1	8.8	9.5	9.3	8.1	5.8	4.7	6.8	6.8	7.04
Agriculture	1.5	-3.5	5.9	6.9	1.6	2.2	7.1	3.8	3.9	4.8	4.4	4.3	3.5	5.2	4.6	2.8	4.1
Industry	4.6	11.4	3.9	-4.0	2.9	9.0	14.0	13.1	14.0	13.6	14.5	12.6	8.6	7.4	10.1	10.3	9.4
Services	-	5.6	8.9	17.7	10.8	8.3	7.0	9.2	10.2	9.8	8.8	7.1	4.3	2.4	5.3	6.1	6.5
Inflation Rate	487	317	311	34.7	67.5	67.6	17.5	5.2	14.4	12.7	4.5	3.6	9.2	2.0	-1.0	0.8	4.0

Source: World Bank 1993 and UNDP Reports (various issues).

Table 3-7: Fiscal Position (% of GDP)

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Total revenue and grants	13.2	12.2	11.3	11.9	14.7	13.5	19.0	22.5	24.7	23.9	22.9	20.8	20.2	19.6	20.5	21.3	19.94
Tax revenue	-	-	-	-	4.0	3.7	5.0	8.3	9.9	10.5	10.3	8.8	8.7	9.0	7.8	8.2	-
Transfers from state enterprises ¹	-	-	-	-	8.6	8.1	10.8	11.2	12.1	9.8	9.5	8.7	8.0	8.0	10.2	10.6	-
Others non-tax revenues	-	-	-	-	2.0	1.4	2.5	2.2	2.1	2.9	2.5	2.6	2.9	2.1	2.0	2.0	-
Grants	-	-	-	-	0.0	0.4	0.8	0.7	0.7	0.7	0.6	0.8	0.6	0.6	0.5	0.4	-
	-	-	-	-													
Current expenditures (exc. Interest)	13.4	12.8	14.1	12.3	14.7	11.4	14.0	18.8	18.3	17.8	16.4	15.7	14.5	13.2	15.1	15.4	-
Social expenditures	-	-	-	-	4.2	2.6	-	6.5	8.0	6.5	6.2	6.9	6.2	5.8	6.7	7.4	-
	-	-	-	-													
Capital expenditure (exc. On-lending)	5.6	3.9	4.4	6.4	5.1	2.8	5.8	7.0	6.9	5.4	5.7	6.2	5.7	7.4	6.7	8.0	-
Interest (paid)	-	-	-	-	0.7	0.8	0.9	1.3	0.6	1.3	1.0	0.6	0.6	0.6	0.8	0.9	-
Contingency	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.8	0.4	-
Total expenditures	-	-	-	-	20.5	15.0	20.7	27.1	25.8	24.5	23.1	22.6	20.7	21.2	23.4	24.7	22.47
Overall Balance (cash basis)	-5.8	-4.4	-7.1	-6.8	-5.8	-1.5	-1.7	-4.6	-1.1	-0.6	-0.2	-1.7	-0.5	-1.6	-2.8	-3.4	-2.53

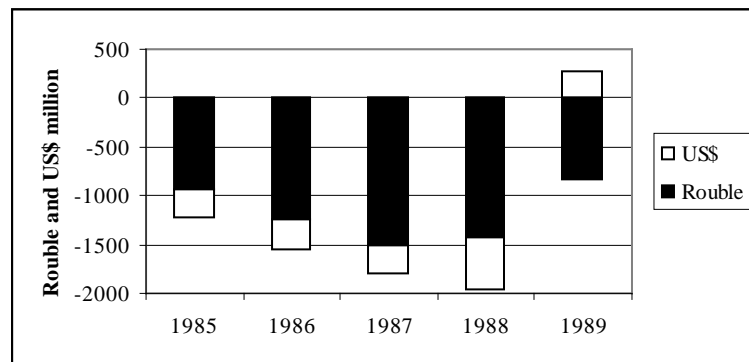
Note: ¹ Transfers include all taxes, operating surplus, depreciation allowances, and capital user fees.

Source: Ministry of Finance and General Statistical Office, and World Bank staff estimates.

In the mid-1980s total exports were around US\$700-800 million a year, of which around US\$350 million went to convertible currency areas. These figures almost certainly underestimated the effective openness of the Vietnamese economy at this time. A high proportion of means of exchange and liquid savings was kept in gold and dollars, and economic agents were surprisingly well aware of relative border prices for tradable goods and services (Fforde and Stefan, 1996). Furthermore, a large amount of unreported merchandise was illegally imported and exported in cross border trade with its neighbours (China, Laos and Cambodia).

Despite the fact that Vietnam could benefit from foreign trade as it has a comparative advantage in terms of cheap and rather highly-educated labour, the barriers imposed by the state ensured that the external sector remained weakly developed. A high proportion of imports, albeit hard to quantify, was financed by the economic assistance program. Reported exports per head grew from 4.5 current U.S dollars-roubles¹¹ in 1976 to 6.3 in 1980 and to 11.7 in 1985. It stayed approximately unchanged until the rapid increases of 1989-1990. See Figure 3.1 for the reported trade deficits with the convertible and nonconvertible areas.

Figure 3-1: Trade Deficits (Roubles and US\$ million)



Note: Rouble data is evaluated at the rate of 1 Rouble equals 1 US\$.

Source: SO 1991c, 1992, 1994a. (Fforde, 1996).

¹¹ Vietnamese official surveys measured foreign trade in “dollars-roubles”. To quote the official source: “For the socialist countries (area I), calculations are in roubles; for the capitalist and developing countries (area II), calculations are in US dollars. At present we do not yet have the means for converting the data into a single united currency” (SO 1987, p. 357).

Before 1985 more than 80 per cent of the budget deficits of the Vietnamese government were financed by loans and grants from COMECON countries. The remainder was covered by loans from the State Bank and from material bond issues. However, the reform of “prices, wages, and currency” in 1985, which led to an annual inflation rate of nearly 500 per cent, was a major cause of high financial deficits, which reached the level of 45 per cent of total expenditure in 1985 but the coverage of foreign aid in deficits was only 40 percent. About 60 per cent of deficits were covered by borrowings from the State Bank, leading to the issue of bank notes.

During the period 1986-1989 the structure of government revenue did not change and was composed mainly of taxes, transfers from state enterprises, and others. But the structure of expenditure changed considerably. Of expenditure, subsidies for basic consumer goods, exports, and loans of state enterprises expanded their share in total expenditure from a level of 15 per cent in 1986 to 29 per cent in 1987 and 1988. The share of wages and salaries in total expenditures increased sharply from 5 per cent in 1987 to 9 per cent in 1988.

Since late 1988 the government took many concrete measures to reform the fiscal and monetary fields. The rate and base of various taxes were revised in response to the level of inflation. The state started trying to mobilise more domestic resources into the budget in 1989. A number of taxation laws were passed in July 1990 and later implemented. In real terms, transfers from state enterprises declined by one-third between 1987 and 1990, while taxes collected from the non-state sector increased slightly. In 1989 all budgetary subsidies, with the exception of small working capital contributed to newly established state enterprises, were abolished.

In conclusion, although there were many physical and institutional difficulties the initial results of economic reforms during 1986-1989 were very encouraging: three digit inflation was curbed; food production increased remarkably leading Vietnam to become the world's third largest rice exporter; export earnings were 2.4 times higher than those for the period 1980-1985; and the GDP growth rate grew steadily. Such success encouraged the

government to take a positive and decisive step in accelerating the process of transition to a market economy with a combination of structural reforms and stabilisation measures.

3.3.2 Period 1990 – 1997: Accelerated structural reform and stabilisation

Entering the 1990s the flow of foreign savings into Vietnam dropped dramatically, and this inevitably had an effect on growth. The rate of GDP growth declined slightly to 5.1 per cent in 1990 but increased again after 1991. Much of the increase in output came from two sub-sectors: oil and rice. Agriculture was a leading sector as rice production responded to price liberalisation and strengthened property rights for farming households. By 1991 the industrial sector was the most rapidly growing sector with the expansion of the oil sector, light manufacturing and agro-processing. The period 1992-1997 was a very good one for Vietnam with the real GDP growth rate averaging 9 per cent per year (see Table 3.6). The main impetus to growth came from private consumption and FDI inflows, which on average contributed over 13 percentage points annually to the real growth rate of GDP. Sectors that made the largest contribution to growth during 1992-1997 were manufacturing (accounting for 27 per cent of total growth in value added), wholesale and retail trade (15 per cent), and agriculture (13 per cent). Within manufacturing, import-substituting industries – metallurgy, machinery, chemical, and materials industries – contributed on average 40 per cent of total growth in manufacturing value added. The main sources of growth in industry during this period were foreign-owned enterprises: their share in industrial production increased to nearly one-third, and they accounted for 42.4 per cent of the increase in industrial output in 1997 (IMF Report, 1999). However, much of the increase in output of foreign-owned enterprises was concentrated in capital-intensive import-substituting industries.

This period witnessed some important reform measures implemented in the SOE sector (see Appendix 3.1.A for a road map of SOE reforms) including: more autonomy to SOEs in production and employment decisions (the contract responsibility system); subjecting of all enterprises to more uniform rules of taxation; allow more enterprises to

establish trade links or to use trade companies of their own choice rather than a prescribed trade channel; and expose all enterprises to more foreign competition through liberalising the trade regime. The State Enterprise Law was passed in 1995 to provide a coherent blueprint for strengthening the sector by limiting the state's financial responsibility for commercial enterprises, establishing rules to control the creation of new enterprises, improving the monitoring and supervision of enterprises, and allowing greater managerial autonomy. This period also witnessed a reduction in the number of SOEs from around 12,000 in 1990 to around 6000 in 1997. Most of this reduction took place by 1994. During 1995-96 nearly half of the remaining state enterprises were grouped under 18 big holding companies known as General Corporations, with the goals that these corporations could reap economies of scale, limit both monopoly powers and disorderly competition, and conserve government administration. However, contrary to intention, the grouping of enterprises has introduced a degree of monopoly power and rent-seeking activity. Their creation has reduced efficiency by lowering the flexibility and the autonomy of production decisions of individual firms, and reducing the rewards for healthy firms to operate profitably (IMF Report, 1999).

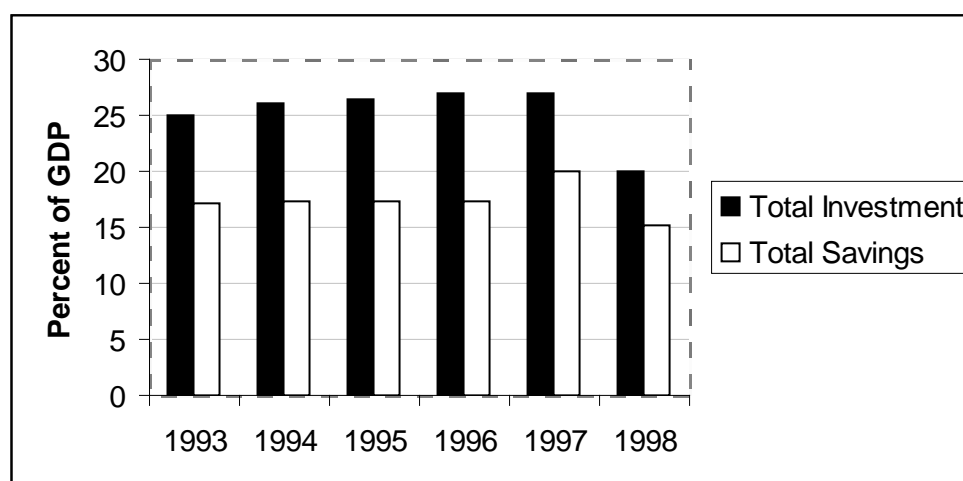
Compared with other transition economies in Europe at the beginning of their transition process, Vietnam has provided an excellent example of successfully reducing rampant inflation. Its inflation rate has declined noticeably and continuously since 1989 with the exception of 1994-1995. As the government has continued with its policy of not borrowing from the State Bank, to keep the money supply under tighter control in the subsequent years, the inflation rate declined from 12.7 per cent in 1995 to 4.5 per cent and 3.6 per cent in 1996 and 1997, respectively (Table 3.6).

The savings and investment pattern have changed considerably since 1990. The traditional source of public investment, Soviet aid, was reduced and then disappeared from 1991. Since then Vietnam has done an impressive job of replacing foreign savings with domestic savings. Total investment increased steadily, reaching 27 per cent of GDP in 1996-1997 (see Figure 3-2). Vietnam achieved this rate due to higher household investment

being put into household small companies in 1993-1994 and to the foreign investment boom of 1995-1997.

The composition of investment, however, changed during this period. The state budget, including ODA, funded a steady portion of total investment through the 1990s, amounting to an annual average of 6 per cent of GDP. State enterprises accounted for an increasing share of investment from 1990, averaging 7 per cent of GDP for the whole period. However, the deteriorating performance of the SOEs also has important implications for government revenue and the non-performing loans of the state banks. Foreign investment inflows reached their peak between 1995-1997 when an average of around US\$2 billion a year was disbursed. At the same time private investment has expanded, with an average 7.1 per cent share of GDP for the whole period. This basic shift is a healthy development for Vietnam. Nevertheless, both public and private investment figures are low compared to other countries in the region.

Figure 3-2: Total Investment and Savings 1993-1998



Source: World Bank, 1998.

Entering the 1990s, Vietnam's savings situation was far better than a few years before. While foreign aid declined the country's bold reform had an immediate payoff in terms of improved national savings, which climbed to 17 per cent of GDP by 1993-1996 and peaked at 20 per cent a year later. Although Vietnam's domestic saving rate is already

above the average of low-income countries, it is still well below regional levels. To meet its expanding investment requirements for further development the government must have policies aimed at liberalising the investment environment for the private sector, strengthening the banks to attract financial savings, and also making itself more attractive to foreign investors (World Bank Report, 2000).

Important fiscal reforms were implemented over this period. In the first five years from 1991 to 1995 Vietnam set up a centralized State Treasury system and implemented the first phase of tax reform. Although the year 1991 was a difficult one, due to the loss of CMEA aid and markets, the overall budget deficit fell to 1.5 per cent of GDP, the bulk of which was financed by foreign borrowing. Compared to 1989 there were reductions of wages, salaries and subsidies to SOEs, bringing the budget into a slight surplus. Government capital expenditure was halved, while Central Bank financing was virtually eliminated. In 1993, the principle of only non-bank financing of the budget deficit was adopted and the fiscal deficit was brought down to a sustainable level in 1994-1995.

During the period 1991-1995 the methods of tax collection, and the base upon which taxes were assessed, had improved. Income tax receipts were still tiny but revenue from agricultural and turnover tax had improved substantially, as had import and export duties. Real revenue and spending had both grown rapidly. Over this period revenue rose in real terms on average by 20 per cent a year, and total spending by 22.6 per cent (Table 3.7).

The trade and exchange system was further liberalised (see Appendix 3.1.B and 3.1.C for details) arising from an increase in the number and scope of private sector involvement in direct import and export activities, and trade barriers were reduced. Private trading enterprises had tripled in number from 3,894 in 1994 to 13,639 in 1997. During the 1992 – 1997 period, the maximum tariff rate was reduced 80 per cent and the number of bands reduced from 50 to 35. The share of imports subject to non-tariff barriers fell from four-fifths to two-fifths. Over the years, most export quotas have been lifted and export taxes have been reduced to generally low levels. In addition, export activities by the private sector – mainly labour intensive manufactures in line with the country's comparative

advantage - have been increasingly encouraged, thus breaking the trade monopoly of a small number of state-owned enterprises. These reforms have led to a rapid export and import growth. As can be seen in Table 3.8, between 1990-1997 the dollar value of imports and exports roughly quadrupled (to US\$10,460 million and US\$9,145 million, respectively), raising the share of trade (including both imports and exports) in GDP from 50 per cent to 86 per cent - a high share by international standards.

Since 1995 there has been a significant shift in the composition of Vietnam's exports (see Table 3.9) as textiles and garments overtook sea products and rice to become the country's second largest export earner after oil, and shoes also moved into the top ten earners in 1996. Textile and garment exports increased nearly ten times from 1992 to 1997 to US\$1,349 million, largely on the basis of increased sales to Western Europe which absorbed about half of the total. In 1997 growth in earnings of crude oil, seafood, garments and footwear led the strong pick-up in total export earnings. Both the Asian and European markets contributed to this spurt in export earnings, although the Asian crisis happened in the second half of 1997. Crude oil export growth came from larger purchases by China and Australia, while seafood was due mainly to stronger demand in Japan and other countries in Asia. Increases in garment exports went evenly to Europe and Asia, while Europe accounted for most of the growth in footwear exports. In fact, Europe increasingly became an important market for Vietnam's exports.

As Vietnam did not receive any significant financing from overseas during the 1990-1992 period, its imports had been constrained by the level of exports. With the principle that export growth must be sufficient to ensure that there was no compression of the level of imports during the adjustment period, the growth rate of imports in Vietnam during this period was not much different from that of exports. Thus Vietnam's current account deficit was kept at a low level (about 2 per cent of GDP during 1990-1992), especially if compared to other developing countries with a similar level of income. The current account deficit peaked at 13.1 per cent of GDP in 1995, but decreased steadily in subsequent years.

Table 3-8: Foreign Trade
(US\$ million)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Total exports (fob)	2,404	2,087	2,581	2,985	4,054	5,449	7,256	9,145	9,365	11,540	14,449	15,027	16,530
Total imports (cif)	2,752	2,338	2,541	3,924	5,826	8,353	10,483	10,461	10,341	10,460	14,072	14,401	19,300
Current account balance (as % of GDP)	-4.2	-1.9	-1.3	-10.9	-12.5	-13.1	-9.9	-6.2	-3.9	4.5	2.1	2.2	-1.5

Source: Data provided by the Vietnamese authorities and World Bank staff estimates.

Table 3-9: Leading Exports
(US\$ million)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Rice	272	225	300	363	429	549	855	870	1,024	1,025	667	625	726
Petroleum	390	581	756	844	866	1,024	1,346	1,413	1,232	2,092	3,503	3,175	3,226
Coal	38	48	47	70	75	81	115	111	102	96	94	108	149
Rubber	16	50	54	74	113	181	163	191	127	147	166	161	170
Coffee	25	74	86	110	328	495	337	491	594	585	501	385	317
Seafood	220	285	302	427	551	620	651	781	858	971	1,479	1,800	2,024
Cashew nuts	13	26	41	44	59	130	130	133	117	110	167	144	212
Textiles & Garments	20	156	221	336	550	800	1,150	1,349	1,450	1,747	1,892	1,975	2,710
Footwear	na	na	na	na	na	na	530	965	1,032	1,392	1,465	1,560	1,828

Source: Ministry of Trade and Bank staff estimates.

In the financial area, continuing the initial steps of restructuring the banking system begun in mid 1988, the government's objectives for further reform were to develop a safe, sound, and competitive banking system that would help protect macroeconomic stability, instil financial discipline and intermediate effectively i.e. mobilise more savings and allocate them to more efficient uses. To do so the government approved two banking laws in 1997 and set up the Bank Restructuring Committee (BRC) aimed at: restructuring Joint – stock banks and State-owned commercial banks; improving the regulatory, supervisory and legal framework; levelling the playing field for all banks; and developing human capacity and resources in the banking sector.

In the period 1990-1997 Vietnam experienced a substantial rise in FDI. Following the 1990 revision that clarified several provisions in the original version of the 1987 FDI law, the amount of foreign investment approved for 1991 doubled over that of the previous year. The increasing trend continued until 1997 as further reforms were introduced. Foreign investment inflows reached their peak between 1995 and 1997, when an average of around US\$2.5 billion a year was disbursed. Much of the capital flowed from East Asia such as from Taiwan, Singapore, Hong Kong, Japan, South Korea, and from other ASEAN firms. Nevertheless, with its advantages of a central location in a dynamic region of the world, strong human resource potential and low-wage labour, it is clear that Vietnam's potential to attract FDI had not been fully exploited during this period. This was due to technical-economic factors, as well as institutional deficiencies (Gates, 2000). Firstly, the underdeveloped physical infrastructure resulted in a great increase in costs of using this infrastructure as well as of improving this infrastructure for foreign investments. Secondly, a major institutional deficiency was Vietnam's property rights system, which made it difficult for foreign investors to obtain and retain user rights to land. Further, its rather opaque legal and bureaucratic procedures on project approval and implementation were deficient. Another problem is with serious corruption spread over all administrative levels.

Before 1996 foreign investors were most active in oil and gas exploration and in the tourism industry. Nearly 30 per cent of the approved investments were in the oil and gas

exploration sector, mainly due to the government's encouragement of capital-intensive import substituting industries. The most active projects in this sector were in the south, off the coastal town of Vung Tau. About two-thirds of FDI has been located in the south despite the government's encouragement and promotion of investment in all parts of the country. The reason foreign investors prefer to have their projects in the south, among other things, is that infrastructure is better than in the north and business practice, as known in the west, is also better understood. Management skills appropriate to a market economy, despite a shortage in both north and south, are nevertheless more available in the south.

The majority of foreign investment projects are joint ventures, mostly with SOEs or state agencies, which often contribute their capital in the form of land use. A revision of the FDI law in December 1992 also allowed private companies to enter joint ventures with foreign investors. Although the FDI law allows for 100 per cent foreign-owned projects relatively few of the approved projects were of this type before 1994, in part because foreign investors preferred to have local counterparts in their projects to benefit from their familiarity with the country and because it was difficult for foreign investors to obtain rights to use land unless they engaged in a joint venture. However, there has been a slight trend away from joint ventures with state enterprises and an increase in wholly foreign-owned investments, as a new decree on foreign investment has been approved in 1996 under which foreign-invested businesses would be allowed to grant mortgages over land use rights and assets attached to Vietnamese banks. Since November 1999 this decree has been applied to foreign banks as well.

Important fiscal reforms were implemented during the period 1990-1997 (see Appendix 3.1.D) with the setting up of a centralised treasury system and implementing the first phase of tax reform. The Treasury gradually extended its network to all provinces and all districts, providing a strong basis for effective budget execution. Vietnam's tax base was diversified during this period. Four new taxes – turnover, profit, import-export and special consumption – were introduced, and, for the first time, the non-state sector and state sector

were largely subject to the same tax rates. After 1994, there were no explicit subsidies from the budget for SOEs (World Bank Report, 2000).

In conclusion, Vietnam's improvements in macroeconomic performance were remarkable for this period: inflation was substantially reduced, the budget deficits declined and external competitiveness increased. Moreover, it successfully doubled its savings rate and tripled investment. Productivity had also been raised through higher capital investment and utilisation of idle capacity, in addition to reforms in the economy's incentive structure in both industry and agriculture. Consequently, economic growth soared over the period 1990-1997: Vietnam's GDP growth averaged 8 per cent per annum. However, the Asian economic and financial crisis happened at the end of this period and changed the course of the Vietnamese economy. Vietnam entered the next period with many internal and external difficulties that required the government to take strong steps in further reforming the economy towards a market economy.

3.3.3 Period 1998 – present: Reform slowdown

The economic and financial crisis that happened in some Asian countries from mid-1997 contributed to a slowing down of economic reforms in Vietnam. To avoid an adverse impact of the crisis on the economy Vietnam has followed a cautious economic stance, giving priority to ensuring macroeconomic stability rather than taking risks in order to achieve higher growth. The government has continued to reform, though not at a pace that could compensate for the deteriorating economic situation. Consequently, economic growth was adversely affected. Growth of real GDP during the two-year period 1998-1999 was around half the rate of the period 1992-1997 (Table 3.6). While agricultural growth was down to 3.5 per cent due mainly to drought in 1998, 1999 experienced a recovery of agricultural performance through higher growth in rice, fishery and livestock. Rice output rose to 32 million tonnes from 29 million and 27 million tonnes in 1998 and 1997, respectively. As a result, rice exports were to top 4.2 million tonnes in 1999, which accounted for 9 per cent of total exports. Livestock, which has been growing quite rapidly

for sometime maintained its strength, while fisheries showed renewed vigour in part led by strong export demand. Low industrial growth was due to negative growth in construction and slower growth in both manufacturing and utilities, which were attributable to the large decline in foreign investment. Slower growth in trade, real estate, tourism and the financial sector dominated the decline in service sector growth during these two years.

To resist the downward trend of economic growth arising from the Asian financial crisis, new and important legislative measures to facilitate the entry of private enterprises and to liberalise trading rights were taken. In mid-1998 the revised Law on Promotion of Domestic Investment provided new incentives for the domestic private sector. This was followed by the approval and implementation of the Enterprise Law in 1999 and 2000. Together with the elimination of more than 100 different business licenses that restricted the entry in different sectors, ongoing implementation of this Law is improving the policy environment for domestic private enterprises significantly. As a result, the number of household-enterprises has increased dramatically, and they are playing an increasingly important role in manufacturing. As of 1999 there were around 600,000 micro household enterprises in manufacturing, a quarter of all micro-enterprises, contributing 28 per cent of manufacturing value-added, and 5,600 private enterprises in manufacturing accounting for 10 per cent of manufacturing GDP (World Bank Report, 2001). As a result, the economy has been recovering with real GDP increasing substantially to 6.8 per cent in 2000 from 4.7 per cent in 1999, primarily due to both demand and supply side developments. On the demand side, private consumption and investment, including FDI, were buoyed by an accommodative fiscal policy and improved business sentiment. Despite a weak external environment and lower commodity prices, exports still grew on average at 4 per cent over the period 2000-2001. Supply side factors contributing to the growth of real GDP included an increase in oil and coffee output, despite other agricultural production being below the record harvests of the last decade. Industrial production also grew at a faster pace than 1999, with growth largely attributable to the domestic market. The service sector was still relatively strong, with retail sales growth staying at 9 per cent, reflecting low import prices,

a sharp rise in government wages, and the expansion of small and medium-sized enterprises.

The Asian financial crisis led to an increase in consumer price inflation of 9.2 per cent in 1998. But average annual inflation decreased to 2 per cent in 1999 and even to a negative number in 2000, which reflected significant declines in the food price index mainly due to a bumper rice harvest.

Most of the significant fiscal reforms took place after 1997. The new Budget Law was approved in 1997 and the VAT implemented in 1999. The Budget Law provides a legal framework for budget formulation, approval, and execution and monitoring, defining clearly revenue and expenditure assignments to different tiers of government. However, revenue as a share of GDP fell substantially, by about 5 per cent, over the last three years of the 20th century, a decline of nearly a quarter of what it was in 1996. Nearly two-thirds of that decline happened in 1998 and 1999, two years of substantially lower growth. Weaker SOE performance and lower import-tax receipts explain most of the stagnation in revenue. Harder times faced by private firms in 1998 and 1999 – whether domestic private corporate sector or foreign-invested sector – also contributed. The decline in import tax revenue is explained by both a shift in the composition of imports away from consumer goods and of course a falling GDP share of imports in these two years.

The government has responded to this situation by cutting planned current expenditures across-the-board. Expenditures were reduced by 4.1 per cent of GDP over the period 1996-1999, but the GDP share of social sector (education and health) spending was maintained. Spending on economic services and general administration was cut and those cuts fell disproportionately on non-wage expenditures. Expenditures on social transfers fell most, but most of this was because spending was shifted from the budget to the Social Insurance Fund. With regard to sector composition, industry and construction, irrigation and transport sectors have not seen many changes during this period, while agriculture and forestry experienced a substantial increase in 1999.

The fiscal stance eased in the first two years of the new century thanks to the windfall in oil revenue. The overall budget deficit estimated at 2.8 per cent and 3.5 per cent of GDP in the years 2000 and 2001 respectively, was higher than budgeted, and was financed by domestic non-bank sources. However, non-oil revenue performance was weak, reflecting, in part, ad hoc reductions in VAT and income tax rates, and also a weak financial performance of SOEs and generous tax incentives (IMF Reports, 2000 and 2001).

The most significant measure was the freeing-up of trading rights for firms registered in Vietnam. These firms were allowed, for the first time, to export and import goods directly without license. This prompted rapid growth in the number of exporting and importing enterprises, especially private trading firms. The domestic private sectors' share in the value of non-oil exports rose from 12 per cent in 1997 to 22 per cent in mid-2000, and in import value from 4 per cent to 16 per cent. However, the regional economic crisis resulted in a slowdown of export growth in 1998, the dollar value of exports increased only 2.2 per cent compared to that of the previous year (see Table 3.8). Facing a decline in exports to Asia – they fell by 20 per cent in 1998 - Vietnamese exporters were striving to diversify to non-Asian markets such as Europe and the US. Exports to Europe and the US grew by more than 19 per cent and 25 per cent per year, respectively, in 1998 and 1999. Petroleum, footwear, textiles and garments were the main products for these markets. This geographic diversification helped to maintain some growth in export earnings. There was a dramatic pick-up in export earnings in 2000 and 2001. The dollar value of exports rose by 25 per cent, led by oil, but non-oil exports also grew by a robust 16 per cent, the same as in 1999. Also, for the first time, nearly half of total exports were conducted by domestic private firms and by foreign invested enterprises, and the share of the domestic private sector in exports jumped from 4 per cent in 1997 to around 15 per cent in 2000.

With regards to the structural adjustment reform policies, since 1998 the country has entered a period in which further reform measures were delayed. With the view that trade controls are an effective means of limiting the impact of external development on the domestic economy, the government tightened trade policies and imposed more restrictions

on foreign trading rights (represented in the boxes under the baseline in Appendix 3.1.B). There was an increase in the categories of goods in the list of licensed goods in order to protect the balance of trade. In addition, the introduction of a new tariff schedule, despite a lower maximum standard tariff (from 60 per cent to 50 per cent) and number of rates (from 14 to 10), has continued very high levels of effective protection. In the industrial area, the SOE reform program has tapered off. The process of equitisation has proceeded at a slow pace, reflecting the weakened pressure for reforms, especially with a slowdown of inflows of foreign direct investment; concerns of workers and management about their jobs; concerns of local governments over losing revenue sources; and the lack of a well articulated framework for equitisation and valuation.

During the regional crisis most currencies in the East Asian countries depreciated, however the exchange rate between the dong and other foreign currencies, especially the US\$, remained stable. However, with the purpose of increasing domestic exports the government decided to depreciate the dong after the second quarter of 1998 (Table 3.9). Major steps have been taken to liberalise the foreign exchange market, including a gradual phasing out of the foreign exchange surrender requirement that was relaxed from 50 per cent to 30 per cent in 2002.

Foreign investment inflows reached their peak between 1995 and 1997 when an average of around US\$2 billion a year was disbursed (see Table 3.10). Inflows fell sharply following the Asian financial crisis with a large reduction from East Asia and Japan. Foreign investment inflows fell by around 60 per cent in 1998 and further in 1999. Recession, as well as adverse investor sentiment, contributed to the continuing decline in foreign investment disbursements. However, while East Asia still experienced a sharp reduction in foreign investment inflows, the inflow of foreign direct investment remained stable in the period 1999-2001, reflecting Vietnam's intermediate position in the region and its achievement in implementing the reform program and especially amendments to the Foreign Investment Law helping to improve the climate for FDI.

Table 3-10: Foreign Investment Commitments and Disbursements
(US\$ million)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Commitments	1582	1417	2321	3661	4167	6566	8633	4397	3899	1677	2200	2510	1350
Disbursements	na	206	380	1112	1936	2672	2607	3250	2200	2110	1966	2300	2200
% Disb./Comm.	na	14.5	16.4	30.4	46.5	40.7	30.2	73.9	56.4	125.8	89.4	91.6	163.0

Source: Ministry of Planning and Investment and World Bank staff estimates.

Table 3-11: Forms of Foreign Investment Inflows (percent)

Share in % Implemented Capital	1994	1995	1996	1997	1998	Total 91-98
Majority joint - ventures	51.0	52.0	59.0	65.0	51.0	56.2
Wholly foreign owned	16.0	18.0	27.0	33.0	17.0	23.7
Business co-operation contract	33.0	30.0	14.0	2.0	32.0	20.0

Source: MPI, Government of Vietnam.

Table 3-12: Exchange Rate
(D:US\$; annual average)

1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
8,819	11,200	10,650	10,954	11,029	11,050	11,689	13,613	13,932	14,170	14,785	15,242

Source: State Bank of Vietnam – UNDP data.

In recent years, although the share of FDI flowing into light industry has increased, most investment is still capital-intensive, which has entered oil-related production, heavy industry or real estate. This structure of foreign investment partly reflects Vietnam's high barriers to heavy industrial imports, which not only protect capital-intensive SOEs but also attracts foreign investors into import-substituting and capital-intensive activities often in the form of joint ventures with SOEs. It has been estimated that more than 70 per cent of foreign investment occurs in sectors with effective rates of protection above 50 per cent. Table 3.11 shows that by the end of 1998 less than 13 per cent of the total stock of FDI was in the labour-intensive light industrial sector, where about 80 per cent of production was exported and where the growth of jobs can be found. Strikingly, even within the non-oil industrial sector, more than half of the investments were in heavy industry. This shows that the amount of export-oriented and labour-intensive foreign investment attracted by Vietnam's high human capital and low labour costs are still modest (Belser, 2000). It is thus unsurprising that foreign investment, although accounting for 31.8 per cent of industrial production in 1998 and accounting for almost half of industrial growth over the period 1995-1998, still employs only 11.5 per cent of all industry workers.

In conclusion, economic growth began to slow sharply in 1998 as the Asian crisis started affecting the Vietnamese economy and exposed underlying structural weaknesses, especially in the SOE and banking sectors. However, the economic outlook for Vietnam improved gradually over the period 2000-2002. This improvement was due to a series of policies and regulations that put the economy on an enhanced growth path, even as the external environment remained weak. This favourable outlook suggests that the effects of the East Asian crisis may be over. However, there will be a lot of possible problems ahead such as global downturns resulting from terrorism or epidemic diseases (SARS, for example), which should be taken into consideration by the Vietnamese government when building the economic development strategy.

3.4 Current Problems Facing The Vietnamese Economy

At the current stage of the economic development process Vietnam is facing significant pressures from neighbouring countries' reform policies that are focused upon raising their competitiveness by currency devaluation and product improvement. As well as from increasing internal challenges due to chronic SOE losses, the resultant heavy fiscal and quasi-fiscal burden, the unfavourable environment for private sector development, systemic risks in the banking sector, low level of domestic savings and investment, and inefficient resource allocation resulting from the import-substitution strategy. Failure to address any of these issues may lead to a slow down of Vietnam's economic growth and even expose the country to serious crisis. This section will briefly discuss these issues focusing mainly on SOE reforms, private sector development constraints, banking sector reforms, trade liberalisation, and fiscal reform policies.

3.4.1 Slow progress of state-owned enterprise reforms

Since 1998, the government has carried out an assessment of all SOEs and developed a detailed SOE reform program. As of 1999, SOEs accounted for 30 per cent of GDP and nearly half of bank credit. But SOE financial conditions have been deteriorating due to inefficiency, overstaffing, and outdated technology. Official estimates show 60 per cent of SOEs were loss makers or marginally profitable as of the end of 1997. Although SOEs show only small book losses, in 1997-1999, the government had to provide about 2.2 per cent of GDP annually in supplementary capital, subsidies, tax exemptions, debt write-offs, and preferential credits. The outstanding bank debt of SOEs at end-2001 was officially estimated at 90 trillion dong, equivalent to almost US\$6 billion. This represents roughly 40 per cent of total domestic credit. Many of the loans given to SOEs by state-owned commercial banks might never be recovered, thus contributing to a weakening of these banks.

State-owned enterprise reforms during the 1990s progressed extremely slowly. After mergers and a rationalisation of the enterprise sector in the late 1980s and 1990s, the reform program tapered off. The process of equitisation was launched in mid-1992, but by the end of 1997 only 17 enterprises had been equitised. However, under the revised guidelines for equitisation, about 130 enterprises were equitised between end 1997 and March 1999. In view of the poor financial conditions and inefficiencies of many SOEs the government adopted a five-year SOE reform plan in March 2001, with annual targets specified for 2001-2003. The objectives of the plan are to reduce losses and improve competitiveness. Around 1,800 out of the more than 5,500 SOEs will be subject to enterprise-specific reform measures, mostly through equitisation (1,400), divestiture (140), or liquidation/closure (220). An additional 200 enterprises will face merger/consolidation. These enterprises are mainly small and medium-sized SOEs in terms of state capital and their debt, but they account for one-third of total SOE employment.

There are some potential explanations for the slow progress of SOE reforms. Firstly, there is still a lack of an appropriate legal framework to convert SOEs into companies operating under the Enterprise Law enacted in 1995. While important regulations concerning the valuation and sale of state equity, which were not touched upon in the last Decrees, were issued between April and July 2002, there has been insufficient time for them to really have an impact on the rate of equitisation. Further, stakeholders in SOEs identified for transformation are still waiting for the new permanently amended legislation before moving ahead with important decisions, thus contributing to the slow down in the process. Secondly, a resistance by insiders, including workers and managers in SOEs is another potential explanation for the slow pace of transformation. For workers, their concerns have focused on the compensation policy for redundant workers after the transformation process of SOEs. For managers or directors, in particular, the resistance has originated from their anxiety of losing their power over the equitised enterprises. Thirdly, the monitoring and enforcement of the transformation process remains weak. Binding constraints do not fit well in a wholly consensual process. There is a gap between having a

mandatory equitisation program and creating a framework where SOEs can transform if they wish to. Lastly, excessive debts are another obvious reason why ownership transformation may be slowing down. Many SOEs are currently burdened by huge debts and payment arrears, thus very few buyers are interested in acquiring their shares. A new mechanism is now being considered whereby the government would trade these debts at a discount price. However, there is a risk that this proposed mechanism could be used to write off the debts of enterprises that are not bound to be transformed, thus raising the prospect that new debts will be contracted only to be subsequently written off (World Bank Report, 2002).

In relation to the speed of SOE reform in other transition countries in Eastern Europe and China, the pace of enterprise reform in Vietnam has been very slow. Most Eastern European countries have made extensive use of privatisation to improve the performance of enterprises, and a recent study points to the importance of ownership changes, complemented by reforms to promote private sector development, as the key to improving the efficiency of the enterprise sector (Havrylyshyn and McGettigan, 1999). In China, which like Vietnam is making the transition to a market economy while maintaining its political system, the pace of SOE is somewhat faster than Vietnam. China has made major progress in the corporatisation of the largest enterprises, about half of which have multiple shareholders and most of these are listed on stock exchanges. Major progress has also been made in divesting the smaller enterprises. Most recently, the constitution has been amended to give the private sector equal status to the state sector. A more detailed comparison of SOE reforms in China and Vietnam is given in Appendix 3.2.

3.4.2 Private sector constraints

Although a significant shift in attitudes toward the private sector occurred recently with the enactment of the Enterprise Law in 2000, the private sector in Vietnam remains more constrained than in other countries in the region, including China. The recent policy and legislative changes have been attributed to a dramatic increase in the number of new

registered firms. In the period 2000-2002 almost 50,000 new enterprises were registered, the vast majority of which are fully privately owned but are relatively small in scale. However, the private sector continues to face various unnecessary restrictions on entry arising from the remaining business license requirements, whose modification and rationalisation are still needed. Access to, and transitions in, land-use-rights remain difficult despite recent changes in land law and security regulations. Access to capital and credit is also more difficult for small and medium enterprises (SMEs), in part because banks are in dire financial straits and in part because lending to SOEs is viewed more favourably than lending to the private sector. Currently, as the report from the World Bank (World Bank Report, 2000) points out, there are four main constraints facing the private sector that should be addressed by changing policies in order to unleash the productivity of this sector. The first constraint is social and administrative attitudes. Negative social and administrative attitudes towards private enterprises colour behaviour towards those engaged in private activities. They influence individual's decisions to enter the private sector and, once entered, constrain their ability to unleash their full potential. Growing one's business and increasing its visibility through success is seen as a risky proposition by many entrepreneurs in Vietnam, because private business has tended to be viewed negatively.

Second, vague and frequently changing regulations and excessive bureaucracy increase the risk and cost of doing business and tax the resources of private entrepreneurs that would otherwise be available for investment or for management of the business, and create an inhospitable business environment. Evidence points out that the bureaucratic stranglehold, exercised through discretion, is a major drag on private sector dynamism.

Third, private business faces some difficulties in gaining access to available financial resources. Although Vietnam's banking reforms aim to address the shortages and problems of availability of credit and capital for the economy, the impact of these reforms on the domestic private sector still remains limited because the institutional arrangements for private transactions in land-use rights as collateral and as equity for joint ventures have not been established.

Finally, there are some problems of corporate governance that impede the private sector to grow in a transparent, accountable, and effective manner. First, a key characteristic of the private SMEs is that their organisations are quite opaque. Not only is the ownership-structure of most of these SMEs not known but also the way decisions are made is unclear. This is not much of a problem when firms are small, but, as they become bigger and owner-managers' span of control is less adequate, absence of appropriate decision-making processes will constrain their growth. Second, most SMEs do not maintain sufficient accounts or make any public disclosure of their accounts. Various types of restrictions, and insufficient social acceptance of business success, lead SMEs to misreport financial and other flows, when reporting is required.

3.4.3 Highly restrictive trade system

Since the introduction of *Doi Moi*, trade liberalisation has been impressive. Restrictions on the establishment of Foreign Trading Corporation were relaxed in 1988, allowing for a rapid increase in the number of enterprises allowed to engage in trade. New trade policy instruments, including quantitative restrictions and tariffs, were introduced and then gradually reduced. The foreign exchange regime was also liberalised. The process has continued at a steady pace in the first years of the 21st century. All the quotas and targets that, together with domestic production targets, were the basis of the central-planning system, have been progressively eliminated¹².

Quantitative restrictions on exports of most sectors have been eliminated as well. The tariff schedule was rationalised in 1992 and simplified in 1999, following Vietnam's accession to the ASEAN Free Trade Area. Currently, there are three sets of rates. Most-favoured nation (MFN) tariff rates are applicable to imports from countries with which Vietnam enjoys the MFN status. Items in this category represent about 75 percent of total

¹² By early 2003, all quantitative restrictions on imports will be abolished with the exception of sugar (to be kept until 2005) and petroleum products. Quantitative restrictions on imports of cement, motorbikes and vehicles for up to eight passengers were scheduled to be abolished by end 2002.

imports. Common Effective Preferential Tariff (CEPT) rates are applicable to imports from ASEAN countries. General tariff rates, 50 per cent higher than MFN rates, apply to all other countries. In practice, trade with those other countries is negligible (World Bank Report, 2002).

While there has been impressive progress in trade liberalisation, Vietnam's trade system remains highly restrictive and needs to be further liberalised. The current trade regime still maintains a policy bias in favour of domestic-market oriented industries, particularly those dominated by SOEs. From a legal standpoint, all registered firms, regardless of ownership, can engage in foreign trade. But barriers exist which discourage trading by non-state enterprises¹³. The tariff structure also consists of a policy bias in favour of domestic industries. Most low tariff rates are on items predominantly used by SOEs as inputs.

This policy bias could impose large indirect costs on social welfare, particularly because of its impact on investment decisions. Scarce resources have been distributed mainly to the manufacturing sector and especially to the capital-intensive industries. As a result, although the manufacturing sector has been modernised substantially in the 1990s, this sector remains inefficient because of a high effective protection rate¹⁴, which is a standard indicator of inefficiency, and the small scale of production. The capital-intensive nature of this sector has also restricted job growth as well as exports.

Commitments under the AFTA, which imply that most quantitative restrictions have to be abolished, will affect many industrial sectors and SOEs in particular. Items in the temporary exclusion list are to be transferred to an inclusion list by 2003, and tariffs to be reduced to a maximum of five per cent by 2006. In addition, the sensitive list is expected to be phased out by 2010. The key effects of preferential liberalisation under AFTA can be

¹³ For example, stringent regulatory requirements demanded by line ministries prevent private firms participating in rice exports and fertilizer imports. Also, monopolies in production may translate into monopolies in trading, as in the case of coal.

¹⁴ The effective protection rate is as high as 599 per cent for domestic-oriented production of motor vehicles and motorbikes, 366 per cent for sugar, 241 per cent for tea, 181 per cent for wearing apparel, and 163 per cent for plastic products (Athukorala, 2002).

understood in terms of a relatively simple set of partial equilibrium diagrams, of the type used by Fukasa and Martin (1998). The reduction in the trading partners' tariffs on exports from Vietnam leads to an increase in demand for exports from Vietnam, as a result the price received for these exports also increases. The resulting increase in the price of exports to the trading partners creates welfare benefits to Vietnam. When access to the markets of the AFTA members increases, there are likely to be increases in Vietnam's import demands for several reasons. First, the rise in domestic prices resulting from the increases in prices for exports to the trading partners is likely to switch demand towards imported goods. Second, there will be changes in the volumes of imports resulting from changes in real incomes. Although the reduction in the tariff on imports from the AFTA partners cause a decrease in tariff revenues, the gains to consumers are greater since they are able to increase the quantity of AFTA goods that they purchase.

Import liberalisation also brings about an increase in exports by changing the real exchange rate. Lowering the domestic price of at least some imports will cause consumers to substitute these goods for non-traded goods. The reduction in demand for the non-traded goods lower their prices relative to the prices of traded goods – a relative price change frequently termed a real exchange rate depreciation (Salter, 1959). This reduction in the profitability of non-traded goods production makes production for export relatively more attractive and increases the supply of exports.

The main feature of the Vietnam-US bilateral trade agreement (BTA) is that the US agrees to accord normal trade relations status, MFN, to Vietnam, albeit subject to annual renewal. Thus, Vietnam will move from column 2 to column 1 tariff rates, allowing Vietnamese goods to enter the US at the same low tariff rates that apply to almost all other countries. In practice, this is expected to reduce the tariff on Vietnamese goods entering the US from around 40 per cent to 3 per cent. Over a period of three years Vietnam will reduce the tariff it charges on imports from the US by about a third, and will eliminate its quantitative restrictions on many agricultural and industrial products over three to seven years. In principle, the key impacts of the BTA on the Vietnamese economy are the same as

those of the preferential liberalisation under AFTA. Beyond tariff reductions the real significance of the BTA is that it maps out a strategy for Vietnam's economic development. It introduces more competition into the economy, and pushes reform and growth overall, especially in the state sector (Nhu Binh and Haughton, 2002). The most immediate effect of the BTA is expected to be a rapid increase in Vietnam's exports to the US, especially of garments and footwear. Vietnam's exports to the US are already growing fast, jumping from US\$319 million in 1996 to US\$1,065 million by 2001, although they are low compared with those of the Philippines, Indonesia and Thailand. However this figure is expected to rise rapidly in the coming years. Commitments under the Vietnam-US bilateral trade agreement also imply that important service sectors, including banking and insurance, have to be opened up to competition. These commitments will also have an impact on the domestic tax system and require tax administration reform to increase the tax base in order to offset the decrease in tariff rates.

Not being, as yet, a member of WTO puts Vietnam at a disadvantage compared with its neighbour, China. China's accession to the WTO, while creating additional incentives for Vietnam to become a member, intensifies the competition with China's exports in third markets as Vietnam shares a similar comparative advantage in labour intensive products as well as competition for FDI. For example, Vietnam's textile and garment industry will be directly affected by the abolition of quotas on Chinese textiles and apparel exports to the US and the EU starting in 2005. As China improves its business environment, foreign direct investment may be diverted away from other countries including Vietnam.

It is argued that WTO membership can bring three main benefits. First, it forces countries to introduce and maintain a relatively liberal economic structure. Second, it gives them permanent and unconditional MFN status with all other members. Finally, it provides access to a dispute settlement mechanism (Michalopoulos, 1998). It is obvious that in order to join the WTO, Vietnam will probably have to make similar reforms to those undertaken by China in its successful quest for membership. Apart from introducing substantial legal and institutional changes, China has committed itself to lowering its import tariffs from 21

per cent (on a trade-weighted average basis) to 8 per cent. Vietnam's trade-weighted average tariff rate in the mid-1990s was quite similar, 19 per cent, although this does not take the substantial degree of smuggling into account. Ianchovichina and Martin (2001), using a computable general equilibrium model, find that, as a result of WTO membership, China's share of world trade is likely to rise from 3.7 per cent in 1995 to 6.8 per cent, and wages of unskilled workers will rise sharply. To the extent that Vietnam shares a similar economic structure, and tariff and trade regime with China, Vietnam is also likely to see relative changes in its trade if and when it becomes a member of the WTO (Nhu Binh and Haughton, 2002).

3.4.4 Banking system problems

After a period of rapid expansion in the mid-1990s, Vietnam's banking sector has come under mounting pressure from the slowdown in growth and the deteriorating financial condition of the state enterprise sector since the late 1990s. In response, the authorities have taken a number of measures to facilitate the necessary restructuring, and have started developing a comprehensive strategy for banking reform. However, as in other transition economies, the problems affecting Vietnam's banking system originate in incomplete reforms of the financial sector and the SOEs. The state-owned commercial banks (SOCBs) still account for 80 percent of loans and deposits and their lending remains subject to official intervention. Accounting practices make credit evaluation problematic; the banking supervisory framework is weak; and supervisors have difficulties in enforcing the existing prudential rules. This has especially affected the performance of the joint-stock banks, which have accumulated large non-performing loans and short foreign currency positions due to imprudent lending and weak regulatory standards, and many are undercapitalised and suffer from serious governance problems. Banks, in turn, have been hampered in their efforts to improve accountability and transparency by the lack of appropriate accounting standards for businesses and also of professional skills. As a result, banks find it difficult to evaluate the feasibility of projects they are asked to finance, and the value of collateral their

customers have to offer. This state of affairs has left the banking system weak and vulnerable, and the regional economic crisis has further strained its fragile condition.

Many problems of the banking system can be further traced to the poor performance of state enterprises, which are the main customers of the banks, especially the SOCBs. In particular, financial discipline remains weak, and, although the SOEs no longer receive direct budgetary subsidies and real interest rates have been kept at positive levels, state enterprises receive extensive fiscal, trade, and credit privileges. A thorough reform of the SOE sector should therefore be a key complement of a longer-term strategy for rehabilitation of the financial system.

Weaknesses in banking supervision and prudential regulations have also contributed to the problems. As the examination function is one of the tools used in the supervisory process, it allows the supervisor to review the operations of an institution to ensure that it is acting consistently with the rules and regulations for the industry. But in Vietnam the inspectors' main duty is only to check whether the laws on monetary and banking operations have been observed by the financial institution. Evaluation of asset quality and other risks in the banks' operations are not yet among the routine tasks.

3.4.5 Weak fiscal management

Since the peak in 1994, budgetary revenue has declined by 7 percentage points to 18 per cent of GDP in 1999. This is closely linked to the deterioration in the financial performance of the state enterprise sector. With a tight budget constraint – most budgetary revenues are spent on wages and benefits of government employees, and purchase of goods and services for existing operations – the government's fiscal resources are inadequate for the provision of such basic public services as infrastructure, health care, education, and social safety net. In addition, the government's inability to provide sufficient financing from the budget for key projects results in excessive pressures on the banking sector for extending policy loans both by policy banks and commercial banks – a fact that is contradictory to the goal of commercialising the banking system. Looking ahead, Vietnam

also faces several long-term fiscal problems, including the large contingent liabilities for recapitalising banks and accrued public enterprise pensions.

In Vietnam, the public investment program emerges as a compilation of national, regional, provincial and sectoral strategies and plans. Its preparation follows a complex process of consensus building designed to guide decision-making by all sectors in the economy. The resulting document is a list of projects that may or may not be implemented over the plan period. This process has several drawbacks. Firstly, there is limited emphasis on economic efficiency in project appraisal, which allows investment in areas where the public sector has no particular advantage over the private sector. Secondly, the poverty and equity implications of investment projects receive little consideration. Thirdly, the separation of the development of sectoral strategies from the resource allocation process makes it difficult to ensure priority programs are adequately funded. Lastly, there are no effective spending needs of new and existing projects budgeting processes to ensure that recurrent spending needs of new and existing projects are adequately catered for (World Bank Report, 2002).

3.5 Conclusions

It is remarkable that Vietnam has shown strong growth throughout its stabilisation and structural adjustment programs. *Doi Moi* policy in 1986, and reforms in subsequent years, brought an initial surge in output, especially in agriculture and services, and GDP increased 8.0 per cent in 1989. However, at that time, Vietnam was still receiving substantial assistance from the Soviet Union. Foreign savings flowing into Vietnam dropped precipitously between 1989 and 1991 and this inevitably had an effect on growth, which declined to 5.1 per cent in 1990 and 6.0 per cent in 1991. Vietnam achieved an impressive record of GDP growth in the mid-1990s, averaging 9 per cent per year during 1992-97. The output growth was closely associated with the surge in foreign direct investment inflows and exports. However, growth began to slow sharply in 1998 as the

Asian crisis started affecting the Vietnamese economy and exposed the underlying structural weaknesses, especially in the SOE and banking sectors.

After a slowdown period during the East Asian crisis, Vietnam is again growing quite strongly with GDP growth of 6.8 per cent and 7.04 per cent in 2001 and 2002, respectively. This improvement is partly due to a series of policy measures that put the economy on an enhanced medium-term path. Confidence in the private sector was boosted by the adoption of a detailed reform program in 2001. Foreign investors have reacted positively to the reform announcements and commitments made by Vietnam. Despite an unfavourable external environment, in terms of demand and prices, exports can be expected to pick up as a result of trade liberalisation efforts, including the Vietnam-US bilateral trade agreement. Strong economic growth is also associated with an external debt at a very manageable level. However, Vietnam's structural adjustment program of transition to a market economy has a long way to go because it has yet to: create a basis for a sustained growth process based on a market economy; diversify the economy; stimulate investment and domestic savings; and improve efficiency and competitiveness of the state sectors, which can lead to a strong macroeconomic development and substantial reduction in poverty. There have been a number of measures for the restructuring and reform of SOEs in the transition period, but the process appears to be slowing down. Reluctance to reform is understandable when over-staffing is pervasive and transformation could lead to massive job losses. Excessive debt burdens may also dissuade potential buyers. But the slowdown in the transformation process also seems to reflect the opposition of many SOE directors, who could lose their powers from ownership transformation. The slowdown and incomplete reform of SOEs can, in part, be attributed to the problems of Vietnam's banking system, as the state-owned commercial banks still account for 80 per cent of loans and deposits and their lending remains subject to official intervention.

A sizeable portion of the structural adjustment has come from development in the private sector, which will be of critical importance in Vietnam especially for job creation and competitive pressure creation required to improve the performance of SOEs. A vibrant

private sector will also provide an important source of investment and could help the economy attain long-term growth. It is also worth noting that achieving an inclusive economic development is largely attributable to following a prudent fiscal strategy, with relatively small budget deficits and low debt, both domestic and foreign. However, there remain some important challenges ahead relating to further progress in economic structural adjustment reforms. They are slow progress of SOE reforms, the private sector development constraints, a highly restrictive trade system, banking system problems, and weak fiscal management.

Although there are many reforms that can be examined, this study will consider four types of policy reforms in the context of a simulation analysis, which will be presented in Chapter 7: state enterprise reform, exchange rate liberalisation, external sector liberalisation, and public investment expansion. These four areas of reform will give a sense of the lessons to be drawn from the model developed in Chapter 5. Before formulating a model which can be used for casting light on the issues of speed and sequencing of reforms applicable to Vietnam, in the next chapter a critical review of the existing macroeconomic models developed the transition economies, including Vietnam, and the models that this study will be based on are reviewed.

CHAPTER 4

ECONOMIC TRANSITION AND MACROECONOMIC ADJUSTMENT: THEORIES AND EMPIRICAL EVIDENCE

4.1 Introduction

This chapter provides an overview of existing theoretical and empirical models concerned with identifying the macroeconomic adjustment processes arising from the transition from a centrally planned to market oriented economy. The theoretical basis and assumptions of these will be examined with the objective of developing a long run macroeconomic model for Vietnam, a transition economy, which can be used to analyse the impact of stabilisation and structural reform policies on the economy as whole.

As mentioned in the previous chapters, characterised by the prevalence of shortages and inefficient production, all transition countries started the economic transition period with imbalances between aggregate domestic demand and aggregate domestic supply. In response to these, and related problems, transition countries embarked on macroeconomic adjustment with the objective of putting their economies on to a path of sustainable development with improved prospects of economic growth and income distribution, while, at the same time, ensuring both external and internal balance. The emphasis of this macroeconomic adjustment can be characterised by the five-point strategy outlined in Fischer and Gelb (1991), including price and trade liberalisation, stabilisation, privatisation and financial reform.

With the aforementioned purpose, and the important role of macroeconomic adjustment in transition economies, Section 4.2 proceeds by presenting a brief survey of the studies on macroeconomic adjustment in transition economies both theoretically and empirically. Empirical studies related to macroeconomic adjustment undertaken for Vietnam since its government implemented the economic reform policies in 1986 will be

presented in Section 4.3. Finally the major conclusions derived from this analysis are presented in Section 4.4.

4.2 Theoretical and Empirical Studies on Macroeconomic Adjustment in Transition Economies

Transition countries undertaking macroeconomic adjustment generally suffer from a broad range of economic problems. These include: (i) internal and external imbalances as reflected in aggregate domestic demand and supply disequilibrium, unsustainable current account deficits, and rising levels of external debt; (ii) high and sometimes accelerating inflation, often accompanied by a situation of monetary and fiscal disequilibrium, and low or negative gross domestic product growth; and (iii) reliance on rationing and control (for credit, imports, prices, and foreign exchange) with consequent reductions in capacity utilisation. In response, the design of a typical structural adjustment program, which has evolved over the past decade in response to the changing economic and political scenarios of these countries, usually comprises the following reforms:

- (1) Liberalisation of prices, trade, and market entry from state controls;
- (2) Macroeconomic stabilisation with the objective of reducing inflation and containing domestic and external imbalances;
- (3) Restructuring and privatisation including the creation of a viable financial sector, reforming state-owned enterprises and transferring their ownership into private hands;
- (4) Legal and institutional reforms that consist of redefining the role of the state, establishing the rule of law, and introducing appropriate competition policies.

This section proceeds to review existing studies in the transition literature on macroeconomic and structural adjustments based on these reform policies respectively.

4.2.1 Liberalisation

Across the transition economies there are a number of reasons that extensive liberalisation has been vital for improving economic performance. First, it decentralises production and trade decisions to enterprises and households, and directly addresses the two fundamental weaknesses of central planning: poor incentives and poor information. Second, liberalisation exposes firms to customer demand, the profit motive, and competition, and it lets relative prices adjust in line with true scarcities. Third, liberalised markets process information better than central planners, and, combined with supporting institutions, competitive markets unleash powerful processes to force technological and organisational change. Finally, liberalisation, by depoliticising resource allocation, helps governments cut subsidies to firms and thus facilitates economic stabilisation (World Bank, 1996).

A number of existing studies have analysed the prospects of macroeconomic liberalisation in the transition economies, concentrating on the linkage between economic performance during transition to variations in liberalisation policy (see Sachs, 1996; Fischer et al., 1996b; de Melo et al., 1996b; and Aslund et al., 1996, among others). Most of these studies use average reform indices developed by the World Bank and the European Bank for Rural Development (EBRD). For example, Sachs (1996) regresses output levels in 1995 against the EBRD's index of liberalisation, finding that countries with the highest index of liberalisation recovered from the transition recession most quickly. Similarly, de Melo et al. (1996b) estimate average growth in gross domestic product as a function of the cumulative liberalisation index (CLI), per capita income in 1989, and a dummy variable if the country is from an area subject to regional tensions. They also examine the relationship of inflation to the CLI, the drop in GDP, repressed inflation, and regional tension. Both these papers reveal strong relationships between liberalisation and performance as measured by either inflation or output or both. A related paper by de Melo and Gelb (1996) adopts a similar framework, however no explicit regressions are run with CLI against

output or inflation. This paper is noteworthy in that it raises the question of the relative role of transition policy versus initial conditions in determining performance.

A somewhat different approach, relating performance with liberalisation, is adopted by Fisher et al. (1996b). These authors pool annual data from 1992 to 1994 for 25 transition economies and regress the log of inflation or GDP on the CLI, income in 1991, the government fiscal balance, and a fixed exchange rate dummy variable. In order to capture the disruptions due to the collapse of the CMEA in 1992, they also add either a dummy variable equal to one for the year 1992 or the share of CMEA exports to GDP. This latter measure is somewhat problematic as no data are available for the republics of the former Soviet Union. For these republics intra-Soviet exports are used instead, but the authors do not report results using the CMEA export to GDP variable.

Åslund et al. (1996), with a quite comprehensive paper, undertake a similar exercise relating economic performance to liberalisation. They argue that the explanatory power of the CLI is not robust under reasonable modifications. The authors discern a substantial difference in the pattern between the much slower recovery in the countries of the former Soviet Union relative to the countries of Central Europe. The conclusion from this paper is that initial conditions, specifically the longer legacy of central planning and greater military burden for the countries of the former Soviet Union, were important determinants of performance differences during the transition. Krueger and Ciolko (1998), however, argue that one commonly used index (the CLI) is, in all likelihood, endogenous to at least one measure of performance, that is the change in total output up to 1995-1997. Hence, the estimates regarding the relationship between liberalisation policy and performance are potentially biased. They also conclude that the rankings of reform progress based on these absolute scales of liberalisation are potentially misleading, or, at a minimum, incomplete.

Hernández-Catá (1999) examines the influence of economic liberalisation and monetary growth on inflation during the transition from central planning to a market oriented economy. He concludes that: price decontrol had a substantial and one-time effect on the price level but with no lasting effect on inflation; that economic liberalisation

broadly defined may have helped dampen price increases; and that monetary expansion has been the fundamental determinant of inflation in the region. The author also finds that the intensity of liberalisation has been related to geographic proximity to market economies, to the size of the underground economy, and to the degree of political freedom. Havrylyshyn and van Rooden (2000) show that economic liberalisation has a more significant impact on economic performance than measures of the quality of the institutional environment, although the latter's importance is increasing over time. Fischer and Sahay (2000) show that average growth over the first decade of transition is best explained by the EBRD's liberalisation and small-scale privatisation indices, whereas the other EBRD transition indicators do not add significant explanatory value.

There are some important parallels between the Asian and European transition economies in terms of the relationship between liberalisation and growth. Economic growth has largely resulted from the lifting of restrictions on new entry and a surge of previously repressed services and export industries in CEE countries, and agriculture in Asia. Freeing prices and trade, reducing subsidies and containing credit can also revitalise growth in previously dormant sectors, by increasing the competitive and financial pressure on firms to restructure. Kalra and Sløk (1999), who conduct a study on the progress made in four Asian transition economies (China, Laos, Vietnam and Mongolia), argue that while initial conditions played an important role in determining the strategy and speed of the transition, growth performance benefited from continued macroeconomic stability and liberalisation in a key sector: especially the agricultural sector. However, the authors have noted that growth has been fastest in only those sectors where liberalisation is most advanced, and the risks to future growth are largest in sectors where most remains to be done. The Asian experience also highlights the importance of liberalisation of price and foreign exchange markets to ensure a market-based resource allocation. These efforts were crucial to reducing economic distortions, and liberalised prices were critical to generating the supply response in the key agricultural sector. In this context, dual price and exchange rate systems

in China, Laos, and Vietnam, while leading to much inefficiency and rent seeking, had the important advantage of providing market signals at the margin.

Many studies in the literature on transition find that trade liberalisation is playing a vital role and has made a significant impact on economic growth in the transition economies. In general, those transition economies that have pursued trade reform most rigorously have recovered fastest from the initial output decline (Brenton et al., 1997). A number of authors have also highlighted a significant positive correlation between growth in exports to non-former Soviet Union (FSU) countries and growth of GDP (see Michalopoulos and Tarr, 1996, for example). Furthermore, trade liberalisation is associated with a broader range of microeconomic reforms, such as price liberalisation and enterprise reform, and also macroeconomic stabilisation. Countries which exhibit little reorientation of exports tend to have been slowest in liberalising trade and in implementing other reforms (Kaminski et al., 1996), and have typically been unable to provide a stable macroeconomic environment.

Many studies analyse the prospects of trade liberalisation in the East Asian transition economies, and concentrate on the linkage between economic performance during transition to variations in trade policy reforms including trading rights, tariff and non-tariff barriers, import and export licensing measures and exchange rate system, such as World Bank (1994, 1997, 1999), Naughton (1994), Martin (1993, 1996, 2001), Fukase and Martin. (1999, 2000), amongst others. The general conclusion from these studies is that the performance of the East Asian transition economies during the 1990s has clearly been remarkable relative to that of the transition economies of the CEE and FSU. Reforms of trade policy, as argued by many, need to focus on opening up the trade system to competing traders, on developing indirect policy instruments such as tariffs, and on removing exchange rate distortions. Although each of the East Asian transition economies have had a successful trade performance, the trade regimes in all of these countries have a considerable distance to go, not only in terms of reducing barriers, but also in terms of

developing systems that will facilitate trade flows and create a more predictable and sustainable investment climate (Martin, 2001).

4.2.2 Macroeconomic Stabilisation

Stabilisation policy is considered as a priority and an essential complement to liberalisation in transition. The empirical analysis in the papers of de Melo et al., (1999), Ickes et.al. (1994) and Balcerowicz and Gelb (1994), support the idea that there are strong interactions between liberalisation and stabilisation. They also support the conclusions of Easterly and Fischer (1994) and Bruno (1994), who find evidence in other countries that neither the effective functioning of markets nor renewed investment is possible with severe macroeconomic price instability; thus, stabilisation becomes a priority for the resumption of growth. However, de Melo and Cevdet (1999) argue that stabilisation is rendered more difficult by severe output contractions during the early stages of liberalisation; such contractions reduce potential tax revenues and raise claims on fiscal resources to cushion the effects. Stabilisation is also rendered difficult by the absence of external financing and by the large depreciation of the exchange rate that accompanies the early stage of liberalisation.

With respect to stabilisation policies in the early phase of transition, in the majority of the transition countries the most important controversies refer to: (i) how to solve a situation of monetary and fiscal disequilibrium. In some nations this discussion has also involved how to eliminate a situation of monetary overhang; (ii) whether the anti-inflationary program should be based on an exchange rate or monetary anchor; and (iii) the extent to which the labour market should be reformed and de-indexed. With respect to each of these areas, some lessons stemming from the developing country experience with stabilisation and anti-inflationary policies has been discussed by some scholars such as Edwards (1992), Bofinger (1994), and Begg (1997), among others.

Although the Latin American experiences offer some important lessons for the transition economies in Europe, Edwards (1992) argues that their policies should not be

mechanically applied because of differences in initial conditions and the political environment between these countries. Based on an analysis of the price level adjustment measures used to eliminate the monetary overhang in Chile in October 1973, which proved to be costly, he also argues that monetary policy should have been immediately followed by a liberalisation of most prices and devaluation. Fiscal adjustment is no doubt a crucial requirement for achieving stability for the countries in the transition process. An important component of this adjustment is the creation of a tax system that is not vulnerable to inflation itself. The adoption of an exchange-rate-based stabilisation program, where the nominal exchange rate is either pegged or its rate of change is predetermined at a rate below ongoing inflation, carries a serious danger of provoking a major overvaluation. To avoid this problem an exchange rate rule should be supplemented with an incomes policy as in the Mexican case.

Similarly, the argument of Bofinger (1994) is that in a transition economy monetary policy is much less powerful than in a market environment, while incomes policies have to play a decisive role in stabilisation policy. Though the classical approach used in his study would allow monetary policy to determine the inflation rate, this is impaired by the lack of hard budget constraints and other financial market imperfections in transitional economies. The experience of some advanced transitional economies suggests that an attempt to stop hyperinflation by monetary policy alone would not be successful. Without the support of effective incomes policies, the short-term effects of monetary restraint on the real economy would be so drastic that this policy would have to be abandoned after a relatively short period of time. He also argues that as long as microeconomic distortions persist, it would also not be advisable to use rule-based schemes for monetary policy. This argument is shared with Begg (1996, 1997) who notes “*monetary (or fiscal) policy may then fail, not because of any fault in its macro design, but because it was not appropriately accompanied by suitable microeconomic policy*” (Begg, 1997, p.34). He suggests that fiscal tightening and more exchange rate flexibility offer a sounder response to large capital inflows

experienced by the transition economies. Poor incentives and corporate governance in banks would have negatively affected their improvements.

Many analysts have emphasised the need for tight and active fiscal policies to support stabilisation and enterprise restructuring; they have also underlined the importance of quickly reforming the tax system (see Fischer and Gelb 1991; Bruno 1994; Kopits 1991; Tanzi 1991, 1993; Balcerowicz and Gelb 1994; and Sachs 1994). The “transitional recession” and lags associated with the development of a new tax system were seen to result in a fall in revenues in the short run, and social expenditures were noticed to increase as they were transferred from enterprises to the budget.

Some observers argue, or imply, that there is a “fiscal constraint” to rapid reform (Chadha and Coricelli 1994, and Aghion and Blanchard 1994). These studies note that there are fiscal costs associated with closing or restructuring state enterprises that need to be offset by revenues generated from new private business. Otherwise, the budget balance deteriorates as reforms are implemented; revenues from state enterprises decline while unemployment benefits increase. These studies further note that tax rates on the private sector need to be low in order not to discourage growth; so, meeting a target budget deficit may require measures to sustain state enterprises, the traditional tax base. However, de Melo et al., (1999) argue that there is no convincing evidence that a slower pace of reform has strengthened the fiscal position of intermediate reformers. Fiscal revenues and expenditure have tended to remain high, relative to GDP, in advanced reformers, and fiscal deficits have been noticeably smaller than in the slower reformers. The lack of adjustment by state enterprises in the face of structural shifts in demand may result in negative value added for many of these enterprises, and therefore no taxable profits. The failure of slow reformers to maintain fiscal balance is highlighted by the fact that their consolidated fiscal and quasi-fiscal deficits are even worse than those of intermediate reformers.

There was much scholarly interest regarding the choice of the exchange rate regime as an instrument in bringing down inflation and as a growth-promoting policy. The discussion of many authors such as Sachs (1996), Roldos (1995), Flood and Mussa (1994),

Rebelo and Vegh (1995), among others, has focused on the role of exchange rate policies in transition economies and, more specifically, on the role of these policies in stimulating the growth of domestic demand and exports. A consensus has been reached that transition economies with stable exchange rates have contained inflation more rapidly and at low cost to growth, and have arrested and reversed output declines much more quickly than did those countries that pursued a flexible exchange rate policy. One reason for this is that the automatic exchange of foreign for local currency by central banks at a fixed rate lets enterprises and households rebuild their real money balances more easily. Nevertheless, stable exchange rate policies have turned out to be detrimental to the growth of output on a sustained basis. Both of these points have been made by Sachs (1996), who explains the impediments to economic growth generated by pegged exchange rates as stemming from various market rigidities in the transition economies that preclude a flexible domestic response to changes in relative prices. There is general agreement that exchange-rate-based stabilisations have been relatively less successful in high-inflation countries where initial booms have been followed by severe recessions (Ades et al., 1993). The impact has been the opposite in low-inflation countries that started with recessions but were able to recover later. In either case, exchange-rate-based stabilisations have been associated with recessions and thus with increased calls for protection. Both Edwards (1992) and Krueger (1997) also cast doubt on the effectiveness of fixed nominal anchors, arguing that inflationary expectations may be strong in countries with a history of rapid and unstable inflation even in the presence of nominal anchors.

There has been substantial debate surrounding the choice of nominal anchors in stabilisation programs (Sachs 1994, Sahay and Vegh 1995, and Citrin et al. 1995). The main choice has been between a money anchor and an exchange rate anchor, both often used in combination with restrictions on public sector wages; and the debate has been primarily over whether greater reliance should have been placed on the exchange rate anchor. The uncertainty of change in money demand, the adequacy of foreign exchange reserves, and the role of the chosen anchor in signalling and establishing credibility are

seen as choice factors. However, what is critical for the success of stabilisation programs is their credibility, and, in the context of transition, credibility does not come without extensive liberalisation (de Melo et al., 1999).

4.2.3 Privatisation and Restructuring of SOEs

Most papers in the literature place emphasis on the impact of privatisation on macroeconomic performance, and the relationship between the state and private sectors in transition economies. For the developing countries, privatisation was only an attempt to ease the financial burden on the state budget of the public enterprise sector. But in the case of the transition economies the objectives are manifold, and they range from economic to purely political and ideological ones. One of the main objectives of privatisation is to contribute to the creation of a market economy (Lipton and Sachs, 1990; Hare, 1994). Improved efficiency of the SOEs and the whole economy is considered another main goal of privatisation. In many theoretical analyses privatisation is equivalent to producing increased efficiency. For example, Dewatripont and Roland (1992) elaborate upon a model of industrial restructuring, where there is a shift towards higher productivity accompanied by massive layoffs. Similarly, for Aghion (1993) transition involves the emergence of the private sector where the productivity of labour is presumably believed to be higher than in the old state sector. Although evidence from the developed and developing countries reported in Balassa (1993) supports the view that the private sector is more efficient, and increased efficiency is often attributed to regulatory reform and greater competition rather than ownership transfer, in the case of the transition economies it seems that changes in efficiency may be related to the way in which ownership transfer is organised as well as to who gets the privatised assets.

According to Cook and Kirkpatrick (1995) the impact of privatisation on performance can be measured in many ways, closely related to the objective of privatisation. If the objective is to foster development of a market economy, the success of privatisation is measured by its contribution to the deregulation of the state sector and the

economy in general. For many countries this broader context is more important than narrow efficiency considerations. Those who are preoccupied with efficiency will seek the effects of privatisation at the enterprise level as measured by financial profitability. An alternative approach is to assess the successes of privatisation in terms of the effect on macroeconomic performance, as indicated by an increase in government revenue from the sale of state-owned assets and to a lower expenditure required to finance loss-making operations. The social impact of privatisation is also regarded as important, and the most commonly used measures are in terms of employment and wages.

Many papers in the literature have focused attention on developing theoretical models emphasising the relationship and interaction between the state and private sectors during the transition. A very simple two-sector model is found in Aghion (1993). Adapted from Blanchard et al. (1991), this model is used to show adjustments in the size of the government sector and the privatised sector when transition policies cause some SOEs to go bankrupt. Aghion uses his results to argue that, during the early period of transition, the state should maintain a substantial fraction of existing large SOEs. This government support should continue until the private sector has accumulated knowledge and capital needed to absorb those SOEs that can be successful in the new environment. Husain's (1994) general equilibrium model is used to analyse the impact of the size of the state-owned sector on the profitability of private firms. He argues that a decrease in the number of SOEs, due to closures or liquidation, may reduce total industrial output in the short-run but encourage the entry of private firms into the industry in the long-run, and lead to an increase in total output. Policies that result in a depreciation of the exchange rate also have a positive impact on output both in the short and long-run.

Gibson and Dutt (1993) also consider a situation where the government is trying to control the size of the private sector, but they use a dynamic macroeconomic model. The conclusions from the model are that, first, the successful restoration of the private sector in transition economies hinges on the responsiveness of entrepreneurs to the opportunities for privatisation, and, second, if the government privatises a sufficiently profitable share of

productive capacity a stable mixed economy is possible. Otherwise, all capital will be owned by either the government or private capitalists.

Using a two-sector general equilibrium model similar to Aghion (1993), Lane and Dinopoulos (1991), however, look at a wide range of reform issues including privatisation, dismantling monopolies, trade reform, and tax reform. They find that the government's ability to put market-oriented reforms into place may be restricted by the government's ability to increase revenue or continuously finance deficits. The authors conclude that tax changes should take precedence in any reform sequence.

Grafe and Wyplosz (1997) develop a model for analysing the role of the real exchange rate and the link between productivity, capital accumulation, real wages, and relative prices in the transition process in which the state sector is gradually replaced by the new private sector. A number of policy implications can be drawn from the model. First, an exchange rate appreciation policy causes labour to be attracted out of the inefficient state sector. Undervaluation of the domestic currency blocks transition by preventing labour from migrating to the modern sectors, while overvaluation may wipe out profitability in the new manufacturing sector. Second, outside finance sources such as foreign direct investment, assistance from the IMF or World Bank, play a crucial role in the early days of reform. However, these grants may act as a disincentive to the elimination of soft budget constraints in the state sector.

4.2.4 Legal and Institutional Reforms

Although there are a number of studies on the importance of institutions and synthetic indicators of the business-friendly environment such as political or business risk, degree of corruption, effectiveness of governance, economic freedom, effectiveness of the legal system and protection of property rights, and political freedom, econometric studies taking account of institutional development as a growth determinant are very few. Havrylyshyn and Rooden (2000), in their pioneering empirical work, analyse the importance of developing market-enhancing institutions for restoring economic growth in

transition economies covering the period 1991-98. Their finding is that the development of an institutional framework has indeed exerted a significant and positive impact on growth, but that progress in achieving macroeconomic stabilisation and implementing broad-based economic reforms remain the key determinants of growth in transition economies.

Although it cannot be denied that favourable policy reforms have been able to spur economic growth, even in the weak institutional setting during the initial period of transition, a growing body of evidence on market economies suggests that, for the longer term, if transition economies are to join the ranks of the advanced market economies, they will need not just good economic policies but strong and accountable institutions to support and implement them. First, they are good laws and effective means for their enforcement. These establish and apply the rules of the game, lower transactions costs, increase commercial certainty, create incentives for efficiency, and control crime and corruption so that businesses can focus on productive activities. Second, are strong financial institutions to encourage saving and channel it to its most productive uses. Financial institutions also play an important role in corporate governance, complementing that of enterprise owners, by imposing financial discipline and overseeing the activities of borrowers. A third essential institution is the government role in supporting and complementing the development of market economies. An excellent summary of the requirements of legal and institutional reforms is found in the *1996 World Bank Report*, which consists of creating a legal framework for private sector development including property rights, contracts, company and foreign investment law, bankruptcy and competition laws; judicial institutions; and increasing the level of trust in the state including constraining state power, controlling corruption and stopping organised crime.

So far, the literature on transition economies has focused mainly on the prospects of macroeconomic adjustment in transition economies. Some have placed their attention on the linkage between economic performance during transition to variations in transition policies, while others have placed emphasis on the role of the privatisation process and relationship between state and private sectors. However, there is, as yet, no paper that

proposes a model enabling the identification of the way in which exogenous shocks transmit their effects to the domestic transition economies. Nevertheless, analysing the macroeconomic consequence of, and adjustment to, such shocks is very important for the transition economies. This thesis, therefore, aims to develop a dynamic long-run macroeconomic model, which will be outlined in Chapter 5, for Vietnam, a small open transition economy, to identify the ways in which both external and internal shocks affect the domestic economy, as well as its structure. Before examining the models that can provide the theoretical foundations to formulate such a model, which is conducted in Chapter 5, in the next section a critical review of the existing macroeconomic models currently developed for Vietnam is conducted. This review is undertaken mainly to identify the existing gaps, so as to build a macroeconomic model that can be used to analyse the extent to which some current reform policies impact on Vietnam's economic development as a whole.

4.3 Empirical Studies on Vietnam

In Chapter 3 the overall picture of the Vietnamese economy was explored, which suggested that, although the reform policies that have been applied since 1986 have succeeded in reviving the economy, other policies will be required to ensure that economic development is not restricted including that of trade liberalisation, SOE privatisation or restructuring. The question to be examined here is whether these adjustment problems have been modelled appropriately in the Vietnamese context. In fact, macroeconomic model building in Vietnam is a very new experimentation, since the country has only been involved for a short time in a transition process to a market economy. A small number of quantitative investigations have appeared from 1998 describing both the short and long run fluctuations in the Vietnamese economy. This section provides a survey of the development of macroeconomic models in Vietnam.

The purpose of the present review is to shed light on the nature of all types of macroeconomic models for Vietnam since its inception. The review focuses on two

aspects: (i) surveying the macroeconomic modelling literature including macroeconometric models, computable general equilibrium (CGE) models, and multisectoral models; (ii) to suggest the limitations of existing macroeconomic modelling, and propose directions in which the modelling efforts need modifications in view of the changing macroeconomic environment.

Compared with other transition economies, particularly China, Vietnam has received much less attention by scholars of both macroeconomic and econometric models. So far the studies being pervasive on the Vietnamese economy in these areas consist of two types, macroeconometric models, and CGE or multisectoral models. This classification is important as it is based on certain major common features shared by a group of macroeconomic models. The two kinds of models described here reflect different motivations towards macroeconomic modelling. Macroeconometric models, in general, are aggregative in character and they generally incorporate a Keynesian type static model with disequilibrium dynamics introduced through lagged adjustment, while CGE models take explicit account of income distribution and its impact on demand and thus price behaviour through a Walrasian general equilibrium framework.

4.3.1 Macroeconometric models for Vietnam

At this time there is only one macroeconometric model, developed by the Central Institute for Economic Management (CIEM) in collaboration with the German Institute for Economic Research (DIW). This model was first developed in 1999 and then updated and re-estimated in 2000, and can be viewed as a step towards the use of a structural macroeconometric model for forecasting and economic policy analysis in Vietnam. There are some main features of the model: (i) the model was based mainly on data for 1990-1998 provided by the National Accounting Framework for Vietnam (NAFVN), therefore the database could be easily updated and its consistency can be guaranteed; (ii) to exploit as much available information as possible, the model estimated GDP by sector of production (at constant prices) and by final expenditure (at current prices), and the development of the

price level was determined endogenously; (iii) the model paid more attention to the public budget and disposable income of private households; and (iv) the model allowed for the impact of external shocks to the Vietnamese economy by determining some principle exogenous variables such as the Dong/US\$-exchange rate, the GDP growth rates of the country's most important trading partners, US prices and international prices for agricultural products, foreign direct investment, money supply (M2), oil production and oil price, and public investment expenditure.

a. Production function

The model takes into account both sector of production and aggregate expenditure (see Appendix 4.1). The included sectors are agricultural production, industry, construction, transport, trade, and services. The production in each of these sectors is explained in a different way. Production in agriculture is mainly real private consumption determined, with another factor being exports of agricultural products. Real private consumption again depends on private households' disposable income and on the development of prices. The output of industry is determined by real GDP and the capital stock financed by foreign direct investment (FDI). The industrial production function is dynamic because it involves a lagged variable. Production in the construction sector depends on public investment and GDP, while transport and communication is explained by real private consumption. The assumption that industrial production is mainly FDI-determined has to be modified, as it also depends on domestic private investment.

b. Investment function

Total investment is modelled as the sum of gross capital formation and changes in inventories. The capital formation component is subdivided according to government and private capital formation. The government component is set exogenously since it is dependent on government policy. The fixed capital formation component depends on FDI flows and on developments in GDP. The other component of investment is inventory accumulation, which is formulated as a function of GDP. Thus, given the chosen formulation, stocks increase as GDP grows.

Obviously, in this model, the links between public sector and private sector investment are not identified to trace complementary and crowding in effects of public investment. The model also seems to ignore constraints on investment growth due to certain gaps: inadequate domestic saving, scarcity of imported capital goods, scarcity of foreign exchange reserves, and an inability of the government to increase public investment. These specifications of the investment function consider the public sector as a stimulant to overall economic growth as well as private investment. The impact of public investment on the domestic capital market has escaped the attention of either the internal or external macroeconomic modellers for the case of Vietnam. There is now, therefore, a need to relate the investment function to other related variables of the financial sector.

c. Price function

In this model, the consumer price index (CPI) depends on the GDP deflator and import prices. The GDP deflator is explained by the gap between nominal and real GDP and real money balances. The real money balance is (by definition) money supply M2 divided by prices (real M2). M2 is an exogenous variable and it is defined as the sum of net foreign assets and net domestic assets. Export prices are made to depend on import prices, the internal price development (measured by the GDP deflator) and the prices of oil and agricultural products multiplied by the Dong/US\$-exchange rate (see equations 23 and 24 in Appendix 4.1). The mechanism of price adjustment is as follows: the prices of oil, agricultural and imported products affect the cost of living, which in turn affect the wage rate in the industrial sector. The wage rate change, in turn, gives rise to changes in industrial prices. Then the industrial prices in turn affect non-agricultural prices.

d. Fiscal sector

The specification of the functioning of the fiscal system, particularly the role of government, is very important in any model for a transition economy. The model developed by CIEM treats government expenditure as endogenous, depending on public consumption, public gross capital formation, transfers from the budget, interest payments, and property transfers. Most of these variables are exogenous to the model, with only

public consumption being endogenously explained by overall public revenue. The public deficit is calculated by subtracting the expenditure items from the revenue items. In this model, there is an explicit recognition of the government's role in improving economic growth through increased public investment. However, developing a model to examine structural adjustment policies requires a detailed fiscal structure. Separation of the public capital and current accounts is obviously needed. While examining government expenditure it is necessary to see how much of it is for public investment (infrastructure) and how much on current expenditure (public consumption). Further, there is a need to see what effects variations in public investment spending have on private investment. This will be given focus in Chapter 5 as a novelty of this study for the case of Vietnam.

e. Monetary sector

Since this macroeconometric model is primarily concerned with the real sector no elaborate monetary module is developed, and it is assumed that monetary disturbances would be reflected by changes in the exchange rate which has a direct effect on prices. There are two reasons for this simplifying assumption. First, the monetary approach to exchange rate determination suggests that the exchange rate represents the relative price between different currencies and is therefore determined by the demand and supply for these currencies. Therefore, the exchange rate of a country not only reflects the money supply but also the demand for money determined by income, interest rates, expectations and other factors that may influence portfolio choices. Second, it is not always necessary to have an explicit monetary model in order to examine the effects of different monetary policies, since these can frequently be introduced as the balancing entries of the real model. Thus, for example, an expansionary monetary policy could be modelled through increases in government expenditure (Wengel, 1993).

In spite of these reasons for the exclusion of a monetary component to the model, its absence limits the flexibility of the model to deal with issues related to savings and the foreign capital account. Since capital flows have gained an increased importance in transition economies in general, and Vietnam in particular, this appears to be a significant

shortcoming. The incorporation of rational expectations in the context of a model that explicitly incorporates the monetary sector, would constitute a desirable improvement of the model developed for Vietnam. This will be attempted by the present study in Chapter 5.

f. External sector

In this model, total imports are constrained not only by domestic demand for consumption and production but also by income obtained from exports. Exports are divided into oil exports, agricultural exports and other exports. Oil exports are the product of the volume of exports, oil price (US\$) and the exchange rate. The export of agricultural production is considered as exogenous, since no satisfactory economic explanation for it could be found (CIEM, 2000). The other export items are explained by their export prices, the real effective exchange rate and the foreign trade weighted GDP growth of foreign trade partners. Broadly speaking, the foreign trade sector has a weak link in this model. With the objective of integrating the Vietnamese economy into the world market, it is essential to model this sector by incorporating export and import functions in greater detail and enabling an analysis of the effects of tariff reductions on the trade balance and current account deficits and what should be the appropriate level of devaluation. This dimension will be incorporated in the model presented in Chapter 5.

As can be seen from Table 4.1, in which the main features of the empirical models undertaken for Vietnam are summarised, the model developed by CIEM (2000) is static but it emphasises both the short and long runs in forecasting economic developments for Vietnam. Two scenarios arising from both external and policy shocks were simulated by CIEM in order to forecast some macroeconomic variables, namely the growth rate of real GDP, the inflation rate, the trade and budget balances. The changes of these variables, which were affected by exogenous shocks, are presented in Table 4.2. In these scenarios the external shocks consist of a change in import prices, demand for Vietnam's exports, export prices including oil and rice, and foreign direct investment, whereas policy shocks include an exchange rate devaluation, increasing domestic credit, and increasing public investment. In the first scenario, it was assumed that the country also faced an unfavourable

external condition due to the Asian financial crisis. The major outcomes from this scenario were that the growth rate of GDP in 1999 was forecast to be 4.3 per cent increasing to 4.6 per cent in 2000. At the same time, the inflation rate, which declined to 3.7 per cent in 1999, increased again to 5.6 per cent in 2000. During these two years the budget deficit to GDP ratio was forecast to be about 2.5 per cent, while the trade deficit to GDP ratio declined considerably in 1999 and vanished in 2000.

A second scenario was established on the assumption that the external conditions in 1999 and 2000 would be more favourable for Vietnam than the first scenario. That is, the real effective exchange rate appreciated by only 2 per cent (instead of 5 per cent as in scenario 1), import prices decreased by 1 per cent in 1999 and increased by 3 per cent in 2000 (instead of by 1 and 2 per cent in scenario 1, respectively), and the Dong devalued against the US dollar by 7 per cent each year (instead of 5 per cent in scenario 1). The results of these simulations show that the Vietnamese economy is relatively sensitive to external conditions. If Vietnam managed to stabilise the real effective exchange rate, long-term growth would be considerably higher, being 6.2 per cent in 2000 compared with only 4.6 per cent in scenario 1. At the same time, price increases and the trade surplus would be larger (6.0 and 2.0 per cent respectively in 2000). The results obtained from scenario 2 are close to what actually happened (see Tables 3.6 and 3.8) with the exception of the inflation rate, which decreased to -0.1 per cent in 2000.

Due to a lack of sufficient or detailed data the macroeconometric model developed by CIEM is not truly dynamic. By using the simple OLS method for the estimation of the behavioural equations the model, it is assumed that the underlying time series data are stationary. However, over the long run, regression of a time series variable on another time series variable may lead to the possibility of obtaining spurious or dubious results. This problem arises if both time series involved exhibit strong trends (sustained upward or downward movement). Thus, in order to avoid the pitfalls of traditional econometric modelling, a time series model of the Vector Autoregression Variables (VAR) type can be used to adequately meet policy makers' needs. There are three reasons why the use of the

VAR type time series model of Sim (1980) has become a popular tool in empirical model building, and as an alternative to large-scale macroeconometric models. First, the method is simple; one does not have to worry about determining which variables are endogenous and which ones exogenous. All variables in VAR are endogenous. Second, estimation is simple; that is, the usual OLS method can be applied to each equation separately. Finally, the forecasts obtained by this method are in many cases better than those obtained from the more complex simultaneous-equation models. Thus VAR models are allowed to reveal the dynamic structure, and to capture empirical regularities in the data, and thereby provide insight into channels through which the different policy variables can act on target variables (Mallick, 1999).

The Granger representation of an Autoregressive Integrated Moving Average (ARIMA) process as a cointegrated error-correction model (Engel and Granger, 1987) provides a kind of synthesis between structural models and *atheoretic* time series models. Most economic time series have an ARIMA representation. One must represent the data generating process as a reduced form VAR model for cointegrating equations, and error corrections for endogenous economic variables. These cointegrated equations present the long run relationships between variables. Cointegration and error correction models can serve both as confirmatory as well as exploratory multivariate time series models in economics. There has been some discussion in recent years on the forecasting performance and on the reliability of policy simulations when one uses different types of models such as unrestricted VAR models, restricted VAR models (including Bayesian VAR models), and models with an error correction mechanism (ECM) (Runkle, 1987).

The cointegration and error-correction models depend on two main foundations – a unit root test methodology and a linear relation between cointegrating economic series. There are a number of methods used for testing the cointegration between variables such as the Engle-Granger (EG) or augmented Engle-Granger (AEG) tests, or the cointegrating regression Durbin-Watson (CRWD) test provided by Sargan and Bhargava (1983). The

employment of an error-correction model can be derived from the long run cointegration relationship. This methodology will be attempted in Chapter 6 of this study.

4.3.2 Computable general equilibrium and multi-sectoral models for Vietnam

In Vietnam, macroeconomic modelling has also been analysed within the framework of a CGE model. This model combines the features of the input-output framework and static econometric models to provide an analytical framework for economic analysis. Rather than being based on time series, as in the case of macroeconomic or econometric models, CGE models are built on the basis of a social accounting matrix. In CGE models, model builders do not necessarily estimate all the parameters, but they can “calibrate” them on the basis of their own beliefs and experience and using parameters derived from other studies.

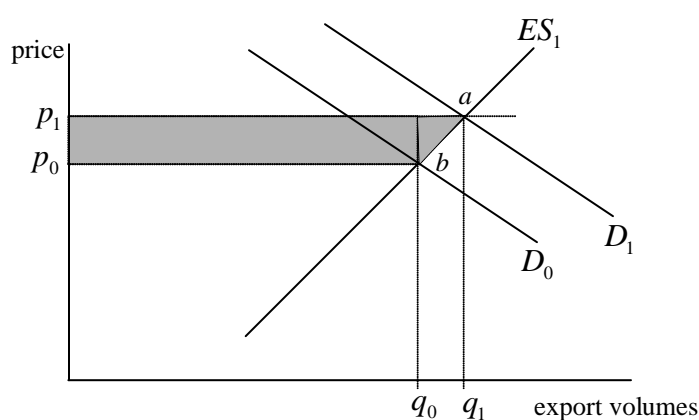
The focus of almost all CGE models developed for Vietnam recently has been on the effects of external liberalisation. Among the CGE models, Ianchovichina et al. (2000), and Fukase and Martin (1999) adapted and applied the now-standard GTAP (global trade analysis project) ¹⁵ CGE models to Vietnam. They used it to trace the effects of lower United States tariffs under the bilateral trade agreement (BTA) between Vietnam and the US, and the effects of AFTA (ASEAN Free Trade Area) liberalisation, to which Vietnam is currently committed, on the economy of Vietnam, respectively. These models are relatively standard static multi-sector multi-region applied general equilibrium models (see Table 4.1, p. 136 for the models’ main features), which incorporate the necessary links between factor demands, production structures, trade and protection. The models assume that firms use constant returns to scale technology in a perfectly competitive product market. Consumption in the household sector is determined by the constant difference of elasticity functional form. The equilibrium levels of production and consumption are determined by global demand and supply of the product and zero economic profit for firms. A key

¹⁵ The original model was developed by Hertel (1997).

assumption of the models is that Vietnamese consumers distinguish between imported and domestic goods, and between imports by country of origin, under the so-called Armington assumption (Fukase and Martin, 1999).

These models present the key features of the analysis and results by a relatively simple set of partial equilibrium diagrams. Two effects of preferential liberalisation under the BTA and AFTA are evaluated: (i) the effects of changes in the rates of protection imposed by Vietnam's trading partners (the US and ASEAN countries); and (ii) the implications of changes in protection that Vietnam levies on its imports.

Figure 4-1: Impacts of a Reduction in a Tariff on Vietnam's Exports to its Trading Partners



Other things being equal, the reduction in the tariff of the trading partners on exports from Vietnam shifts the demand curve for exports from Vietnam to the right, as is shown in Figure 4.1. The result is an increase in both the volume of exports from Vietnam to the trading partners, and an increase in the price received for these exports

from p_0 to p_1 . The resulting increase in the price of exports to the trading partners creates welfare benefits to Vietnam, measured in Figure 4.1 by the area p_1abp_0 .

Figure 4-2: Impact of Vietnam's Liberalisation on Partner Imports

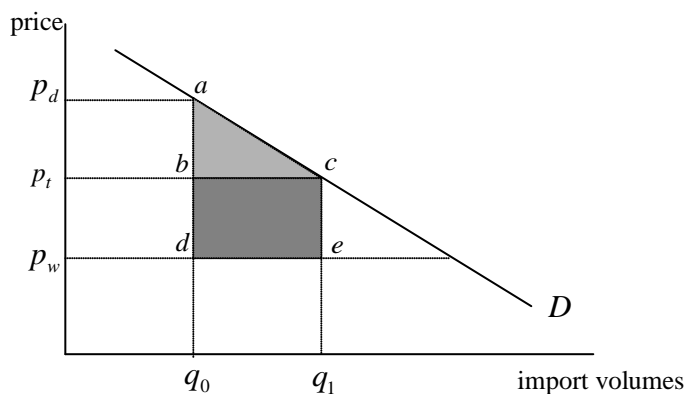


Figure 4.2 presents the market for goods imported from Vietnam's trading partners (the US and ASEAN countries for these two models). In the initial equilibrium, Vietnam imposes a tariff t on the trading partners ($p_d = p_w + t$). Preferential tariff rate T is introduced through a

reduction in the tariff on imports from the partners. This reduces tariff revenues on initial imports from trading partners by $p_d abp_t$. However, the gains to consumers are greater since they are able to increase the quantity of imported goods that they purchase. Following the decline in the domestic price, consumers move down the demand curve D from initial quantity q_0 to q_1 . Consumer surplus increases by the area $p_d abp_t + abc$. In addition, with the increase in the imports from trading partners, the loss of revenues is partially compensated by the area $bced$. Therefore, the net gain to Vietnam in this market is approximated by the area $aced$. This is the welfare benefit from trade creation.

Based on this framework the attention of Fukase and Martin's (1999) quantitative model was given to analysing how the changes in relative prices resulting from tariff reductions affect key variables such as trade patterns, terms of trade, factor returns, and welfare levels¹⁶. Another focus of this model was upon how each policy affected Vietnam's industrial structure. Two shocks are simulated, including: (i) a reduction of tariffs under the AFTA plan both by Vietnam against ASEAN-5¹⁷ and by the ASEAN-5 countries against Vietnam, and (ii) unilateral liberalisation applied between Vietnam and the APEC¹⁸

¹⁶ Table 4.2 (p.136) synthesises the main results of the simulation. Appendix 4.2 presents the simulation results in detail.

¹⁷ The members of ASEAN-5 are Singapore, Thailand, Malaysia, Republic of the Philippines, and Indonesia.

¹⁸ The members of APEC are Australia, Brunei Darussalam, Canada, Chile, China, Hong Kong (China), Indonesia, Japan, Republic of Korea, Malaysia, Mexico, New Zealand, Papua New Guinea, Republic of

countries under the APEC framework. Unlike AFTA, APEC trade liberalisation is based on a unilateral and non-discriminatory basis. These two shocks were divided into five scenarios for the model simulations (see Appendix 4.2 for the experimental design and results).

The simulation results from this model showed that with AFTA liberalisation the outputs of agriculture, forestry, and processed agriculture increase, whereas they decrease when Vietnam extends the concession to the rest of the world. There is substantial expansion of the apparel industry, particularly when Vietnam liberalises against the rest of the world either unilaterally or in APEC. This is partly because low cost intermediates, resulting from import liberalisation, lowers the cost of production, and partly because Vietnam has a comparative advantage in the labour-intensive sectors against non-ASEAN countries whereas its competitive position for these commodities is less clear within ASEAN. In contrast, the output of some import competing sectors, such as transport equipment, and beverages and tobacco, are likely to contract due to increasing competition (see Table A4.2.1 in Appendix 4.2).

AFTA liberalisation can raise wages for both skilled and unskilled labour as well as the return to capital. The magnitude of these increases more than double when Vietnam extends its liberalisation to the rest of the world. Returns to land increase under AFTA liberalisation, whereas its return decreases with non-discriminatory liberalisation. With further liberalisation with the rest of the world, a portion of labour seems to shift from the agricultural sector to the industrial sectors. The conclusion from this simulation is that a wider scope of Vietnam's liberalisation is likely to induce Vietnam's industrialisation (see Table A4.2.2 in Appendix 4.2).

The terms of trade was used to evaluate the effects of price changes on welfare in this model. In general, trade liberalisation leads to a deterioration in Vietnam's terms of

the Philippines, Singapore, Taiwan (China), and the United States. Peru, Russia and Vietnam joined in November 1998.

trade primarily through decreased prices received for exports, but a further part results from the increased price of imports (see Table A4.2.3 in Appendix 4.2).

In the context of some important economy-wide variables, as the scope of liberalisation widens from partial AFTA to non-discriminatory, both imports and exports increase. The magnitude of increase in trade value is the highest with the non-discriminatory liberalisation, which implies a 12.8 per cent increase in imports and a 15.2 per cent increase in exports (see Table A4.2.4 in Appendix 4.2). Tariff reductions also cause losses of tariff revenues, ranging from 18.0 per cent in scenario 2 to 82.4 per cent in scenario 4 (see Table A4.2.4 in Appendix 4.2). The change in tariff revenue under discriminatory liberalisation has three components: (i) a loss of revenue resulting from the fall in rates on the goods liberalised; (ii) a gain from increases in the volumes of liberalised imports; and (iii) a loss of revenue from reductions in the volumes of import flows not being liberalised. The third loss is frequently critical to the welfare impacts of discriminatory liberalisation.

However, the results drawn from the simulations also indicated that when Vietnam extends its AFTA commitments to all of its trading partners on a most favoured nation (MFN) basis, its welfare increases substantially because of the greater extent of liberalisation and the more efficient allocation of resources among Vietnam's industries.

The model of Ianchovichina et al. (2000) was designed to conduct simulations of the effects of reducing US tariffs against imports from Vietnam from their 1996 general rate levels to their MFN levels, and of reducing import protection from Vietnam. Based on trade and tariff data for 1997, the authors found that Vietnam's exports to the US would nearly double, from US\$416 million to US\$794 million, after a change to MFN status. The increase in exports to the US of beverages and tobacco, textiles, basic manufacturing, and electronics and machinery are significant, while exports of agricultural and forestry products decrease. This is because the general tariff rates on major agricultural exports, such as coffee and shrimps, are already zero. These industries do not benefit from the move to MFN status, and the labour-intensive manufacturing sectors that do benefit are able to

attract labour away from the lightly protected sectors. Due to the BTA, Vietnam's imports from the world increase by 2.8 per cent. About 40 per cent of this increase in imports is attributed to the textile sector, reflecting the increase in demand for textiles as inputs into the clothing sector (see Table A4.3.1 in Appendix 4.3).

With MFN status, Vietnam's exports increase by 1.2 per cent. As goods are redirected from the domestic market to the export market, the domestic consumer price index rises by 2 per cent (see Table A4.3.3 in Appendix 4.3). However, higher foreign exchange earnings from increased exports enable Vietnam to import more, and this in turn leads to an increase in tariff revenues of US\$27 million. Total welfare, as measured by Equivalent Variation¹⁹, increases by US\$164 million, or a 0.5 per cent increase in real expenditure per capita, and at a minimum Vietnam's real income would rise by 0.9 per cent. By granting MFN status to Vietnam the US also gains from improved resource allocation, although some of the gains are offset by a deterioration in its terms of trade. The gains for the United States were estimated to be around US\$48 million per year.

The experiments conducted in these models are comparative-static in nature (see Table 4.1, p.136), and the models contain no money or financial assets in the system. These models did not consider the effects of external liberalisation on growth rates, nor the 'natural' growth of trade which would occur without further liberalisation. The models focus mainly on the effects of a tariff reduction in the short run but do not fully deal with the long-run effects of trade liberalisation, and particularly on exchange rate policy (see Table 4.2, p.136).

In a more recent study, using the same approach as that of Fukase and Martin (1998, 1999), Tyers (2001) developed a multi-commodity comparative static macroeconomic model to analyse, for the short term, the effects of a negative terms of trade shock on the agricultural and fishery sectors, and the effects of a number of possible reform policies to see how best to redress the negative consequences of external shocks. The model is also

¹⁹ The amount of additional money needed to give the level of utility which an individual could have reached if the price of a commodity fell, or a new commodity became available.

used to assess the long run direct and indirect effects of taxes, tariffs and quantitative restrictions on the economy and the agricultural and fishery sectors (see Table 4.1 and 4.2, p. 136).

This model uses a comparative static approach, similar to that of Mundell-Fleming (1961). In this comparative static model it is assumed that the price level is endogenous but continuous inflation is ruled out, and there is only one domestic interest rate. A length of run is considered over which investment does not alter the current physical capital stock. The model incorporates both a microeconomic global general equilibrium model that has its genesis in GTAP, and the key structural features of the Vietnamese economy. These structural features include: sticky nominal wages, flexible prices, imperfect capital mobility, and a fixed nominal exchange rate.

In this model the production function is of a standard neoclassical variety depending on the use of effective labour and physical capital, in which only labour is endogenous. However, the most important investigation that is required for the case of transition economies such as Vietnam, is how does the physical capital in each sector, government, private and foreign, contribute to aggregate supply. This will be executed in Chapter 5.

In Tyers' (2001) model, investment demand is modelled as a function depending positively on the quantity of effective labour employed and negatively on the market interest rate. A separate specification for the government and private sector is not identified, nor the link between them. Thus the relationship between the investment function and other related variables of the financial sector have been ignored. The price function is not explicitly modelled either in this model.

Knowing that the specification of the functioning of the fiscal system, especially the role of government, is very important in any model for a transition economy, one key modification of the model by Tyers (2001) is that it makes government financially independent and so enables more explicit treatment of fiscal policy. The monetary sector is modelled within the overall framework of the money-multiplier theory of money stock determination. More specifically, the multiplier values of the stock of broad money and

aggregate deposits depend on two asset ratios: the currency to deposit ratio of the public, and the reserve to deposit ratio of the banks. The demand for money is influenced positively by aggregate income and negatively by the domestic interest rate. In the spirit of comparative statics, although price levels do change in response to shocks, agents represented in the model do not expect any continuous inflation and so there is no distinction between the real and nominal interest rates. Exports are determined by the real exchange rate, while imports are determined by both disposable income and the real exchange rate. The current account deficit and its impact on macroeconomic variables are not explicitly modelled in this model.

The external shocks that were used for the model simulation consisted of (i) a global slowdown represented by a 5 per cent fall in the elasticity of consumption to income in the US; (ii) a trade liberalisation policy represented mainly by the reduction of import tariffs and export and production taxes; and (iii) reform policies in the short run focusing on both bilateral and multilateral liberalisation between Vietnam and the US, EU and ASEAN. The results obtained from the model simulation showed that, in the short run, the negative terms of trade effect induced by the global slowdown caused a real depreciation, deflation and aggregate output (GDP) reduction. Reduced employment and output lowered the return on installed capital in Vietnam, and this reduced overall investment. There is a more adverse effect from the real depreciation on the service sector than on the others, where the coffee and fisheries sectors have contracted the most in response to the falls in their export prices. Rice production does not contract, despite the fall in its export price. This is because reduced overall income bolsters the expenditure share of staple foods, and because a small amount of land is reallocated out of coffee into other agricultural activities including rice.

In the long run, if all structural features assumed in the short run are relaxed, a trade liberalisation policy may lead to a substantial overall economic expansion, in particular in the light labour intensive manufacturing sector where Vietnam has a comparative advantage. This is fuelled, in part, by a considerable rise in the rate of return on installed capital, which attracts large foreign investment. In the agriculture sector the main

beneficiary from trade liberalisation is specialty crops such as fruit, vegetables and nuts which become more important for exports, whilst the fisheries sector and coffee producers are hurt. The rice sector also declines, though this is in part a consequence of its dependence on the previously protected processed food industry.

To redress problems associated with the more hostile external economic environment, some policy reforms are suggested from the model simulation. They are: (i) a unilateral 20 per cent liberalisation of all import tariffs and export taxes; (ii) the US BTA: a 20 per cent liberalisation of trade distortions against US goods in Vietnam and against Vietnamese goods in the US; (iii) the extension of the US BTA to Europe: a 20 percent liberalisation of trade distortions against US and European goods in Vietnam and against Vietnamese goods in both the US and the EU; and (iv) the ASEAN free trade agreement: 20 per cent bilateral liberalisation on the mix of items detailed by Fukase and Martin (1999). The effects of policy reforms in the short run come mainly from a unilateral 20 per cent liberalisation of all import tariffs and export taxes. This leads to a domestic output expansion with restored employment. Because the liberalisation raises the rates of return on installed capital in each sector, when the capital controls have been removed and more investment allowed, this change would see GDP expand by an extra 2 per cent and employment by an extra 4 per cent. The agriculture sector, however, continues to contract overall even with the added reform. The bilateral trade reforms are also valuable, though they have more limited scope and so are not as advantageous as the unilateral reform. When the bilateral agreement with the US is extended to the EU the pattern of net gains is similar to unilateral reform. In fact, if more foreign investment is allowed in combination with the bilateral reform, the gains yielded by the US-EU agreement begin to look better than unilateral across-the-board reform because of reductions in US and EU distortions against Vietnam's exports.

Among the macroeconomic models, Sand-Zantman et. al. (2000) use a multisector macroeconomic model of a small developing economy in transition, to highlight linkages between agriculture and the rest of the economy and the consequences of external opening

up. By presenting a simple two-sector model for Vietnam they develop a system of supply-demand equilibrium equations for an agriculture sector (sector 1), in which production is assumed to be rigid, and a non-agricultural sector (sector 2), consisting mainly of industry and services, which is assumed to be demand-led with imperfect competition. According to this dual theoretical pattern, the labour market is segmented with an unlimited supply in the rural area. In the latter case the labour force is employed in the agricultural sector and in the rural non-agricultural sector. Urban workers are employed in the non-agricultural sector but may face unemployment. The wage gap between urban and rural areas induces migration. The model is then calibrated on the basis of Vietnamese data for the period 1989-1997. An ex-post forecast and base line forecast are computed for the period 1993-1997 and 1997-2010 respectively, in order to check the consistency of the model with observed and targeted indicators planned by the Vietnamese authorities.

In this model, agricultural production (sector 1), at constant prices, is determined by constant capital productivity and a rate of capital accumulation that is also exogenous. In the demand-led sector 2 (industry and services), the production capacity depends on endogenous capital productivity, which is a function of domestic and foreign investment. The investment behaviour embodies a flexible accelerator, and capital accumulation decreases with rising idle capacity. FDI is also introduced as part of total investment, but only in sector 2.

Price functions are specified separately for sector 1 and sector 2. The model determines the agricultural price in two steps: (i) a market clearing process determines an equilibrium “shadow” price, assuming the export price to be equal to the domestic production price and to the domestic demand price; and (ii) effective domestic demand and exports are a function of a lagged price. At this price, the gap between effective external and internal demands and supply entails adjustment of agricultural inventories. The price of sector 2 output is set according to a mark up over total unit cost, including input and labour costs, with a negative influence from idle capacity.

Exports of agricultural goods increase with domestic output and price competitiveness. These exports are strongly price elastic, and, according to the small country hypothesis, foreign demand is assumed to be unlimited. The model excludes agricultural imports. Export and import functions of non-agricultural goods both depend on price competitiveness and idle capacity. Exports increase with foreign demand and imports with domestic demand. Foreign prices and the nominal exchange rate are exogenous.

In this model, the labour market is modelled and segmented into two sectors. Labour demand from the non-agricultural sector 2 depends on both the level of product demand and endogenous labour productivity. For agriculture, labour supply is assumed to be unlimited. The sum of individual incomes amounts to agricultural value-added. Changes in rural and urban labour supply are determined by the respective natural rates of demographic growth, corrected by the exogenous urban and rural activity rates of population, and by endogenous migration. Urban unemployment results from the difference between urban labour demand and supply. Migration depends on the expected urban/rural wage differential (with the expected urban wage equalising the actual urban wage multiplied by the probability of getting a job). Migration decreases the rural labour supply and increases the urban one. Fiscal and monetary sectors are not explicitly modelled in this model.

Two sets of simulations are presented. The first set of analytical simulations aims to assess the consequences of elementary demand and supply shocks. They include: (i) a 20 per cent exchange rate devaluation; (ii) a 10 per cent rise of the urban wage; (iii) a 10 per cent foreign demand increase in sector 2; (iv) foreign investment increases by 3 per cent of GDP in sector 2; and (v) a 10 per cent domestic investment increase in sector 2. A second set combine the elementary shocks in order to explore the impact of the dramatic recent changes faced by Vietnam. These changes include (i) the combination of increasing domestic saving and investment, and a strictly monitored trade opening up, in order to speed up capital accumulation and modernisation; (ii) a more liberal strategy that induces an increase in foreign direct investment; and (iii) the impact of the Asian financial crisis on

the Vietnamese economy resulting in a decrease in foreign demand for Vietnamese exports, a decrease in foreign direct investment and imported inputs, and a devaluation of the Vietnamese Dong. The main features of the model and its results are synthesised in Tables 4.1 and 4.2, respectively.

In terms of elementary demand shocks, a 20 per cent exchange rate devaluation improves competitiveness in sector 2, which in turns leads to an export rise. As a result, the current account improves in the first year following the devaluation. A devaluation stimulates real GDP and investment growth, but inflation, which occurs strongly in both sectors (15.3 per cent and 9.2 per cent during the first year for sectors 1 and 2 respectively), gradually dampens this recovery.

A 10 per cent rise of the urban wage increases non-agricultural prices, but allows for purchasing power gains due to the lag in price adjustment. The initial boom in household consumption is offset by a fall in exports and a rise in imports due to the reduction of competitiveness. Thus, the value-added in sector 2 declines, while the accelerator effect and the slowing down of investment amplify the recession.

A 10 per cent increase of foreign demand in sector 2 leads to an improvement of exports and in internal demand. The increase of prices and wages slows down this trend and deteriorates competitiveness. Due to the rigidity of the supply sector the price increases in the agricultural sector, and, as a result, reduces agricultural exports. However, the trade balance is strongly improved.

In the context of supply shocks, from the simulations of two scenarios, the results show that an increase in both foreign and domestic investment promotes growth due to productivity gains and higher competitiveness. In consequence, non-agricultural exports are boosted. Demand is also stimulated through rising investment, which is partly imported. On the whole, GDP increases with a slowdown of inflation. The trade balance deteriorates slightly. However, foreign investment, which enables technology transfers, has a larger impact on economic growth potential than domestic investment.

A second set combines the elementary shocks in order to explore the impact of the dramatic changes recently faced by Vietnam. The first shock is based on the combination of increasing domestic saving and investment, and a strictly monitored trade opening up, in order to speed up capital accumulation and modernisation. The results show that the combination of a significant saving effort and a high rate of accumulation and productivity gains, generates foreign trade and investment-led growth without worsening the current account. Successful disinflation policies during the transition period in a country like Vietnam seem to be linked to the capacity of promoting supply. In this scenario the role played by agricultural modernisation is also highlighted. The second shock presents a more liberal growth strategy whereby modernisation is backed by foreign investment, as experienced by the “Asian Tigers” and China. Due to the increase of investment and to productivity gains, a regime of balanced growth can be achieved with an improvement in competitiveness and a restrained current account deficit. Consumption is also sustained due to the increase in income. Lastly, some real aspects of the impact of the Asian crisis on the Vietnamese economy have been simulated. The decrease of foreign demand and the decline of FDI have a negative impact in terms of a sharp decline of GDP and of investment, in spite of the balancing effect of the devaluation of the dong. The decrease of urban migration limits the magnitude of the increase in unemployment. The increasing inflation is mainly due to the effects of the devaluation.

An often mentioned criticism of CGE models is that they are static in nature in spite of multiple attempts to incorporate dynamic elements. The result has been that in applied studies, CGE models fail to show anything but very modest welfare gains or losses. However, it must be admitted that these models have shown that the distributive impact of different policy measures may sometimes be significant (Wengel, 1993). CGE models also present empirical problems: the emphasis on sectoral disaggregation leads to a large informational requirement in order to estimate the large number of parameters involved in detailed CGEs. Limited data availability in the transition countries such as Vietnam obviously precludes the econometric estimation of these parameters and the modellers have

to assume a set of parameter values for the developed models and describe an equilibrium, and then keep altering these parameter values until the model can track adequately the observed values of the variables.

Since CGEs are built on the basis of social accounting matrices, rather than being based on time series, and the data to construct them is only required for one year, this also leads to another weakness of these models: there is no way to evaluate their performance. As Ray (1984) indicated: *“the main problem with this methodology, as is well known to people in the field, is that there is no obvious way of testing whether the model is a good approximation to the truth”* (Ray, 1984, p. 18). This contrasts with the many possibilities for the evaluation of the specification, estimation and simulation properties of macroeconometric models.

In conclusion, as can be seen from Tables 4.1 and 4.2, although three of the five models do analyse the effects of external and policy shocks upon the economy for the long run, none of these models emphasises the long run nature of the adjustment process and the link between the short and long runs. All these models deal with trade liberalisation, focusing mainly on an exchange rate devaluation and tariff reduction. The discussion in these models has been fragmented in that it has taken a sectoral rather than a comprehensive look at the reform package. All these deficiencies will be corrected by the present study, as discussed in the following chapters.

Table 4-1: The Main Features of the Economic Models Undertaken for Vietnam

Models	Type of models				External shocks ¹		Policy shocks ¹			
	Static	Dynamic	Short-run	Long-run	Demand shocks	Supply shocks	Exchange rate	Tariff reduction	Privatisation of SOEs	Monetary or fiscal policies
Central Institute for Economic Management (CIEM) (2000)	Y	N	Y	Y	Y	Y	Y	N	N	N
Fukase and Martin (1999)	Y	N	Y	N	N	N	N	Y	N	N
Ianchovichina et al. (2000)	Y	N	Y	N	N	N	N	Y	N	N
Tyers (2001)	Y	N	Y	Y	Y	Y	N	Y	N	N
Sand-Zantman et al (2000)	Y	N	Y	Y	Y	Y	Y	N	N	N

Note:

- “Y” means yes and “N” means no.
- ¹ The policy implications arising from these shocks are simulated using these models.

Table 4-2: The Main Simulation Results of the Economic Models Undertaken for Vietnam

Simulation shocks	Central Institute for Economic Management (2000)			Fukase and Martin (1999)				Ianchovichina et al. (2000)				Tyers (2001)			Sand-Zantman et al (2000)		
	GDP growth	Inflation	Trade balance	Industrial growth	Agricultural growth	Inflation	Trade balance	Industrial growth	Agricultural growth	Inflation	Trade balance	GDP growth	Inflation	Trade balance	GDP growth	Inflation	Trade balance
1. Exchange rate devaluation															+	+	+
2. Tariff reduction				-	+		+	-	-		+						
3. Adverse terms of trade												-	-	-			
4. Increased demand for exports															+	+	+
5. Increased investment															+	-	-
6. Combined simulation shocks ^a	+	+	+									+	-	+	+	-	+

Note:

- “+” means increase for GDP growth and inflation or a surplus for the trade balance.
- “-” means decrease for GDP growth and inflation or a deficit for the trade balance.
- Blank spaces mean the models did not use these kinds of shocks or did not focus on these variables.
- ^a Combined simulation shocks include some shocks identified in the table or others not identified here.

4.4 Conclusion

Overall, the focus of this chapter has been placed upon reviewing the basic models in the literature, which can be used to develop a macroeconomic model for Vietnam as a transition economy. Although there is an increasing literature devoted to analysing the problems emerging in the transition economies, the studies reviewed have focused mainly on the prospects of macroeconomic adjustment in transition economies. Some have placed their attention on the linkage between economic performance during transition to variations in transition policies, others have placed the emphasis on the role of the privatisation process and the relationship between the state and private sectors. However, there is not as yet in the literature a model that enables the identification of the way in which exogenous shocks transmit their effects to the domestic transition economies.

In this sense, such recent studies for the case of Vietnam cannot be found. As can be seen from the reviewed studies, the development of macroeconomic modelling in Vietnam is still in its initial stage. There is only one simple macroeconometric model and several CGE models that have been developed for Vietnam as a transition economy in the last decade. Almost all these models are static, and their focus has been placed upon trade liberalisation and mainly on tariff reductions when Vietnam becomes a member of AFTA and APEC, when Vietnam signed the bilateral trade agreement with the US, and when Vietnam joins the WTO in years to come. The fact is that neither type of model emphasises the long-run nature of the adjustment process and the link between the short and long runs, possibly due to the lack of data. Perhaps, more importantly, modelling the macroeconomic development of a transition economy such as Vietnam's is simply incomplete in these papers. So far none of the existing studies analysing the speed of the reform policies include the exchange rate, tariffs, restructuring or privatisation of SOEs, and monetary and fiscal policies. The objective of the present study is to fill this gap by developing a theoretical model that can be used to explore further the macroeconomic implications arising for a transition economy operating with either a fixed or flexible exchange rate

system. In particular, to identify which of these two extreme systems best offers insulatory properties, in the sense of reducing the volatility of adjustment of key macroeconomic variables arising primarily from the implementation of reform policies at different speeds. Developing an appropriate model from the existing literature is necessary. Three basic theoretical models contributed by Mundell-Fleming (1963), Dornbusch (1976) and Branson (1977, 1984), although they have not been developed specifically to look at a transition economy, can provide the basic building blocks for developing a dynamic macroeconomic model for Vietnam as a transition economy. The next chapter will present these three basic theoretical models. Based on these models, and other models contributed by Harvie and Lee (1996) and Harvie and Kearney (1996), a dynamic long run macroeconomic model for Vietnam, with some appropriate amendments and modifications, will also be presented in the next chapter.

CHAPTER 5

MODELLING MACROECONOMIC ADJUSTMENT IN VIETNAM'S TRANSITION ECONOMY

5.1 Introduction

This chapter is concerned with modelling the macroeconomic adjustment of Vietnam as a transition economy. The model will explicitly identify the ways in which this adjustment affects the domestic economy, as well as Vietnam's economic structure. The macroeconomic adjustment emphasised focuses upon that arising from economic liberalisation and the restructuring processes, specifically involving the abolition of state production and trading monopolies, the creation of a favourable environment for the development of the private sector, creating an import tariff structure, liberalising the domestic currency, and expanding foreign investment. All these have occurred since the initiation of economic reforms in 1986. The model gives emphasis to the long-term nature of the dynamic adjustment process, recognising the effects that such adjustments have had upon the long-term development of the Vietnamese economy. The economic developments emphasised are those of domestic output production, private capital stock, foreign asset stocks, exports and imports, the trade and current account balances, the real exchange rate, private sector real wealth, and the domestic inflation rate. The macroeconomic adjustment model adopted for Vietnam has its foundation in the models contributed by Mundell-Fleming (1963) (MF), Dornbusch (1976) (DB), and the Portfolio balance models (Branson, 1977 and 1984) (PBM), and also in the Harvie and Lee (HL) (1996) and Harvie and Kearney (HK) (1996) models which were developed to incorporate the supply side of the economy and capital stock accumulation within the context of a fixed exchange rate.

The model developed is based on the special characteristics of the Vietnamese economy, and a number of important assumptions. The main characteristics of the economy of Vietnam are as follows: a high share of state-owned enterprise production in domestic

output; a small share and underdeveloped private sector; a high degree of government control over credit policy and allocation; a high degree of government control over international capital mobility in the context of a less developed financial market; the existence of a fixed exchange rate regime; the importance of government spending for the development of infrastructure; and the existence of both domestic and international trade barriers. The model developed will focus on the macroeconomic adjustment of the economy of Vietnam by explicitly incorporating the aforementioned characteristics.

The key characteristics and uses of the model are as follows. First, the model separates domestic aggregate supply into two sources; state and non-state production. The re-structuring of the Vietnamese economy, in the context of privatisation of SOEs and private sector development, is a key policy issue, which has important implications for the development of the Vietnamese economy in the future. Second, it can be used to analyse the effects of a nominal exchange rate devaluation and tariff reduction on the economy, as committed to by the Vietnamese government when it joined AFTA, signed the bilateral trade agreement with the US, and as a likely prerequisite for it becoming a member of WTO in the next few years. Third, it emphasises the role of government expenditure, which is divided into two categories; government consumption, and government investment. In reality, due to a relatively high percentage of the labour force working in the government sector in Vietnam, government consumption has been largely spent on paying salaries. While this has contributed to an increase in domestic aggregate demand, it may lead to a decrease in government expenditure on public infrastructure. Finally, the model is also capable of incorporating different degrees of control over capital flows, along with the adoption of either a fixed or flexible exchange rate regime. All these key policy issues will be analysed in much greater detail in Chapter 7, in the light of the discussions conducted in Chapters 5 and 6.

This chapter proceeds as follows. In relation to developing a macroeconomic model for a transition economy, specifically Vietnam, Section 5.2 will present three basic theoretical models, MF, DB, PBM respectively, upon which the model developed for

Vietnam is primarily based. Section 5.3 will present the macroeconomic model developed in this study, representing an extension of existing models by incorporating new developments that will cast light on the issues of speed and sequencing of reforms applicable to Vietnam. Some alternative versions of the base model will be represented in Section 5.4. Finally, Section 5.5 presents the major conclusions.

5.2 The Basic Theoretical Frameworks

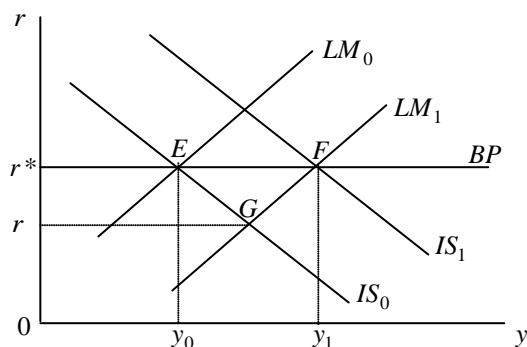
In this section the theoretical frameworks of the Mundell-Fleming (MF), Dornbusch (DB) and Portfolio balance models (PBM) are analysed and their limitations, including that in the context of this study, highlighted.

5.2.1 The basic models

5.2.1.1 The Mundell-Fleming model

The MF model is a model of a small open economy with unemployed resources, a perfectly elastic aggregate supply curve, static exchange rate expectations and perfect or imperfect capital mobility. The model shows that the relative effectiveness of monetary and fiscal policies depends on both the nature of exchange rate arrangements and the degree of international capital mobility.

Figure 5-1: MF Model under a Flexible and Fixed Exchange Rate with Perfect Capital Mobility



The MF model can be represented in the context of the $IS - LM - BP$ schedules (see Appendix 5.1) as in Figure 5.1. The IS curve slopes down in (r, y) space (A5.1.12) since a fall in the rate of interest stimulates domestic absorption, via the implicit investment function,

thereby raising aggregate demand which is then matched by an equal rise in aggregate supply. The LM curve slopes up (A5.1.13) because, as income rises the demand for money increases; therefore, for a given real money supply, the rate of interest must rise to reduce the demand for money in order to maintain money market equilibrium. Under the assumption of perfect capital mobility the slope of the BP curve, which represents equilibrium in the foreign exchange market, is zero or a horizontal straight line at a domestic interest rate that is the same as the international interest rate (A5.1.15).

The MF model can be used to generate some very powerful policy advice. To examine these policy implications, first consider monetary and fiscal policy with perfect capital mobility under a flexible exchange rate. In terms of Figure 5.1, from the initial equilibrium at E , the LM_0 schedule will shift to the right to LM_1 if the authorities apply an expansionary monetary policy conducted by an open market purchase of bonds by the central bank. At the initial levels of income and world interest rate (y_0, r^*) the expansionary monetary policy must imply a potential balance of payments deficit and a depreciation of the exchange rate. With the domestic interest rate effectively fixed at the world level and prices assumed constant the only way money market equilibrium can be restored is via an increase in income, from y_0 to y_1 . The latter will occur because the expansionary monetary policy leads to an incipient decline in the domestic interest rate from r^* to r_0 , which in turn leads to a capital outflow and exchange rate depreciation. The rising price of foreign exchange will, on the assumption that the augmented Marshall-Lerner condition is satisfied²⁰, result in an improved trade balance and have an

²⁰ The condition states that a depreciation will improve the trade balance only if the sum of the exchange rate elasticities of export and import demand is larger than unity. In deriving this condition, make the simplifying assumptions: (1) domestic prices P are unaffected by the exchange rate e , where e is measured in units of the domestic currency per unit of foreign currency; (2) domestic output is held constant; (3) export and import volumes are determined by the real exchanger rate (P^*e/P where P^* is the foreign price level) and with imports also influenced by domestic output Y . Then the trade balance (BOT) in domestic currency may be written as:

$$BOT = PX - (P^*e)IM \text{ where } X = X(P^*e/P) \text{ and } IM = IM(P^*e/P, Y) \quad (1)$$

Assumptions (1) and (2) imply $\partial P / \partial e = \partial Y / \partial e = 0$. Differentiating (1), then obtains:

$$\partial BOT / \partial e = (P \partial X / \partial e) - (P^*e \partial IM / \partial e) - P^*IM \quad (2)$$

expansionary effect on income as demand is switched from foreign goods to home goods; income will continue rising, and the IS_0 schedule moves to the right to IS_1 where money market equilibrium is reached at point F. Hence, in the case of perfect capital mobility and a flexible exchange rate, no fall in the interest rate is possible, so that the full burden of external adjustment falls on the exchange rate. The outcome is a greater increase in income resulting from an expansion of the domestic export sector via a domestic currency depreciation.

By contrast, an expansionary fiscal policy will give rise to an appreciation of the exchange rate that will completely crowd out the increase in government expenditure. In the case of a fixed money stock and constant price level the LM curve of Figure 5.1 is unmoved but fiscal expansion shifts the IS curve to the right, from IS_0 to IS_1 , via a direct injection into the flow expenditure. This leads to a potential rise in the rate of interest above the world rate and hence a larger foreign inflow of capital which will appreciate the exchange rate. The appreciation of the exchange rate implies that domestic exports become more expensive abroad, while foreign imports become cheaper in the home country, thereby reducing the net exports of the home country, shifting the IS_1 curve back to the left, to IS_0 . As a result in a flexible exchange rate regime and perfect capital mobility, fiscal policy is ineffective in influencing real output.

Consider next expansionary monetary and fiscal policies with a fixed exchange rate and perfect capital mobility. The impact effect of the increase in the total money stock has to be the downward shift in the LM curve in Figure 5.1. Starting from balance of

$$\partial BOT / \partial e = \frac{PX}{e} \left(\frac{e}{X} \frac{\partial X}{\partial e} - \frac{P^* e^2}{PX} \frac{\partial IM}{\partial e} - \frac{e P^* IM}{PX} \right)$$

If assuming initial payments equilibrium $PX = e P^* IM$, then

$$\partial BOT / \partial e = \frac{PX}{e} (|\eta_X| + |\eta_{IM}| - 1) > 0 \quad (3)$$

For a depreciation to lead to an improvement in the trade balance it is required that $\partial BOT / \partial e > 0$ and therefore:

$$|\eta_X| + |\eta_{IM}| - 1 > 0 \quad (4)$$

Equation (4) is the Marshall-Lerner condition where η_X and η_{IM} are the exchange rate elasticities of exports and imports respectively.

payments equilibrium at point E the shift of the LM curve leads to a fall in the interest rate from r^* to r , and this must worsen the capital account balance. At the same time the increase in income with an unchanged exchange rate causes a deterioration in the current account, as can be seen at the point G in Figure 5.1. In the case of perfect capital mobility the fixity of the exchange rate implies that the authorities must be losing reserves. As they intervene to support the currency the money supply will fall with the assumption of no sterilisation policy being applied, and the LM schedule will shift back to intersect IS at the initial equilibrium point, E . The impact effect of monetary policy on real output under a fixed exchange rate regime is also represented mathematically in Appendix 5.1. In this case where capital is perfectly mobile ($k_i \rightarrow \infty$) a monetary expansion does not alter real output (see A5.1.35) or the interest rate (see A5.1.37). The only change is in the composition of the money stock. An increased quantity of domestic currency reserves leads to a lower quantity of foreign currency reserves by the same amount (A5.1.39).

With a fixed exchange rate, an increase in government spending will shift IS_0 to IS_1 in Figure 5.1 and would be effective in raising income. For example, an increase in government spending by raising income would increase the demand for money and the rate of interest. The latter would attract a potentially infinite inflow of capital, shifting LM rightwards and increasing income by the full multiplier (see A5.1.41).

Consider now monetary policy with imperfect capital mobility and a flexible exchange rate. Expansionary monetary policy shifts the LM curve rightwards. The incipient excess liquidity puts downward pressure on the interest rate (A5.1.19), generating incipient excess demand for foreign currency and thus causes the domestic currency to depreciate (A5.1.21). This shifts both the goods market equilibrium schedule and the balance of payments equilibrium schedule. The new long run equilibrium is at a higher level of output (A5.1.17). However, under imperfect capital mobility, monetary policy is less effective in altering the level of output than in the perfect capital mobility case. The reason for the dampened effect of monetary policy is that the depreciation of the domestic currency required to eliminate the balance of payments disequilibria under imperfect

capital mobility is smaller than in the case of perfect capital mobility, and therefore increasing output by a smaller proportion.

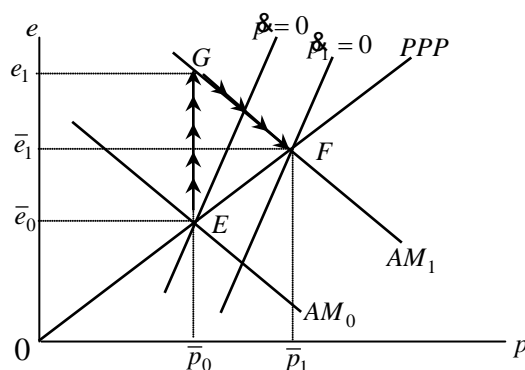
A fiscal expansion leads, as in the perfect capital mobility case, to a rise in income (A5.1.23) by shifting the *IS* curve rightwards. This puts upward pressure on the domestic interest rate (A5.1.25) because of an increased demand for money when incomes rises, which in turn causes net capital inflows since the domestic interest rate rises above the world rate. The net effect on the exchange rate is not clear (A5.1.27). It depends on the degree of international capital mobility. If capital mobility is comparatively high, the *BP* curve is flatter than the *LM* curve, and expansionary fiscal policy will generate higher income, an appreciation of the exchange rate, and a current account deficit that is offset by the effect of a higher interest rate on net capital inflow. However, if capital mobility is comparatively low the *BP* curve is steeper than the *LM* curve, and capital inflows are less responsive to changes in the interest rate. An improvement in the capital account caused by an increased capital inflow does not outweigh the deterioration in the current account. In this case the balance of payments moves into deficit, which induces a depreciation of the exchange rate.

The conclusion of the MF model is that the relative effectiveness of monetary and fiscal policy is very much dependent on the choice of the exchange rate regime and the degree of capital mobility. With perfect capital mobility monetary policy has no effect on output under a fixed exchange rate, but has a powerful effect under a flexible exchange rate. In contrast, fiscal policy has a powerful effect on output under fixed rates and no effect under flexible rates. These results are reversed when there is imperfect capital mobility. However, relaxing various restrictive underlying assumptions of the MF model, such as allowing a variable price level to deflate money balances and non-static exchange rate expectations, may yield different results from those discussed above, and this will be considered in the next model - the Dornbusch model.

5.2.1.2 *The Dornbusch model*

With the purpose of developing a theory to explain observed large fluctuations in the exchange rate and of establishing that such exchange rate movements are consistent with rational expectations formation, the DB model (1976) extends and amends the MF model to draw on the fact of differential adjustment speeds in goods and asset markets. In fact, the dynamic aspects of exchange rate determination in the DB model arise from the assumption that exchange rates and asset markets adjust instantaneously relative to gradual adjustment in non-financial markets. Within this framework the model assumes that prices are sticky in the short run but variable in the long run (purchasing power parity holds in the long run but not in the short run) resulting in disequilibrium in the goods market, whereas the interest rate and exchange rate are perfectly flexible responding to any shock instantaneously and hence financial markets are in continual equilibrium. In the short run, a monetary expansion will, if real output is fixed, lower the interest rate and cause the exchange rate to overshoot its long run depreciation and to account therefore for fluctuations in the exchange rate and the terms of trade. During the adjustment process, rising prices may be accompanied by an appreciating exchange rate so that the trend behaviour of exchange rates stands potentially in strong contrast with the cyclical behaviour of exchange rates and prices. In this context the exchange rate is identified as a critical channel for the transmission of monetary policy to aggregate demand for domestic output. The model is explained in Figure 5.2.

Figure 5-2: Dornbusch Model: Monetary Shocks under Perfect Capital Mobility



The workings of the DB model are also mathematically illustrated in Appendix 5.2. In Figure 5.2 the positively sloped locus $\dot{p}=0$ shows the equilibrium values of the exchange rate (e) and price level (p) that clear the goods market. Asset market equilibrium is presented by the asset market schedule, AM , which is negatively sloped. Thus,

for asset market equilibrium, the rise in p above \bar{p} implies that real money balances have fallen, requiring an increase in the rate of interest to maintain money market equilibrium, which in turn requires an expectation of an exchange rate depreciation so that e must appreciate relative to \bar{e} . This will worsen the trade balance but be offset by a large capital inflow.

A crucial feature of the adjustment process is that the asset market clears instantaneously while the goods market adjusts only slowly. In Figure 5.2 point E , where both goods and asset markets are in equilibrium and the exchange rate is at its purchasing power parity value, implying that the trade account is also balanced, is one of long run equilibrium. An increase in money supply will lead to a rise in the long run nominal exchange rate, \bar{e} , and domestic price level, \bar{p} in proportion to the increase in money supply. The AM curve shifts to the right and the new long run equilibrium is at point F , where purchasing power parity is re-established. But the assumed short run sluggishness of prices precludes the new equilibrium from being obtained instantly. If the price level cannot initially adjust, and since y is exogenously given, the only way the money market can clear is by a fall in the interest rate. With perfect capital mobility the initial rise in the money supply will, for a given price level, lead to a lower interest rate, a capital outflow and an exchange rate depreciation. The exchange rate will depreciate by more than the long run depreciation so that the uncovered interest parity condition is maintained: the exchange

rate overshoots its equilibrium value. This is shown by the movement from E to G and \bar{e}_0 to e_1 .

However point G , at which purchasing power parity is violated, can only be a point of short run equilibrium, the new long run equilibrium is at point F . At point G the lower interest rate and exchange rate depreciation will create an excess demand for goods. However, in contrast to the MF model, this excess demand does not lead to an output expansion²¹, rather it gives rise to inflationary pressures. The excess demand at G pulls up domestic prices, that is the move from G to F along AM_1 , and this reduces real money balances and increases the domestic interest rate over time. The rising interest rate in turn will lead to an incipient capital inflow which appreciates the exchange rate, thus ensuring expected yields are continually equalised.

In the DB model an increase in government expenditure does not lead to exchange rate overshooting. However, by incorporating the explicit specification of a linkage from the real exchange rate to the level of domestic output, the Devereux and Purvis model²² demonstrates that real fiscal shocks may also generate volatile exchange rate movements. This is shown mathematically and graphically in Appendix 5.2.

However, what happens to the short run response and dynamics of the system if the assumption of perfect capital mobility is relaxed? With imperfect capital mobility the exchange rate is not determined solely in asset markets, as the trade account and the capital account both have a role to play. Recall that the balance of payments BP comprises the current account CA and the capital account CP . Suppose that the current account depends linearly on the real exchange rate, $e - p$ and the capital account depends linearly on the expected excess yield of domestic assets, $i - i^* - \theta(\bar{e} - e)$, then:

$$BP = \xi(e - p) + \kappa[i - i^* - \theta(\bar{e} - e)]$$

²¹ In the version of the Dornbusch model reviewed here output is held constant.

²² This model emphasized here refers to Pentecost (1993), “*Exchange Rate Dynamics*”, Chapter 5.

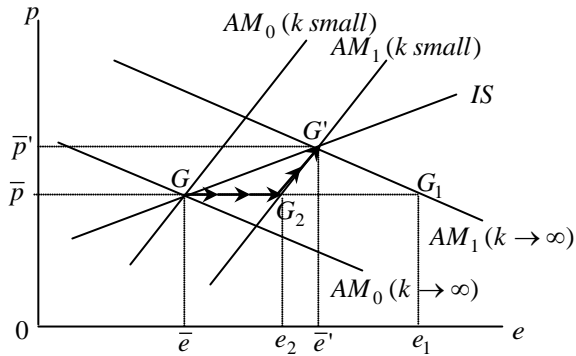
By integrating this generalised condition for a balance of payments equilibrium into the DB model, represented in Appendix 5.2, the model with imperfect capital mobility is obtained. The equilibrium condition for the asset market or AM schedule is as follows:

$$p = \frac{m - \phi y + \lambda i^*}{1 - \lambda \xi / \kappa} + \frac{\lambda \theta \bar{e}}{1 - \lambda \xi / \kappa} - \frac{\lambda \theta + \lambda \xi / \kappa}{1 - \lambda \xi / \kappa} e$$

The slope of the new AM curve depends on the sign of the expression $-(1 - \lambda \xi / \kappa)$. It can be negative or positive. The schedule AM is positively sloped as shown in Figure 5.3 if ξ / κ is very large, that is if the current account responds strongly to movements of the real exchange rate or if capital mobility is very small.

Figure 5.3 illustrates that a given money supply expansion in the long run shifts the economy from G to G' , no matter whether the AM curve is positively or negatively sloped.

Figure 5-3: Dornbusch Model: Monetary Shocks under Imperfect Capital Mobility



For $\kappa \rightarrow \infty$ the present model is identical with the original DB model. Therefore the exchange rate initially overshoots from \bar{e} to e_1 . If ξ / κ is large enough for the AM schedule to be positively sloped, the exchange rate no longer overshoots. During the impact period, it only jumps to e_2 . Subsequently, it begins to rise towards

\bar{e}' , with the pace being set by the simultaneously increasing price level.

Assume that the current account is in equilibrium at point G . The increased nominal money supply will lead to a capital account deficit if the exchange rate remained at \bar{e} , since domestic assets pay a lower interest rate and are expected to devalue. Thus, the balance of payments would be in deficit. If the exchange rate were to rise to e_1 the capital account would remain in equilibrium, but the country would run a current account surplus. Thus, any exchange rate between \bar{e} and e_1 generates a current account surplus and a

capital account deficit. At some exchange rate higher than \bar{e} and smaller than e_1 the current account surplus and the capital account deficit balance.

In summary, the main features of the DB model are that, in the short run it emphasises the stickiness of prices in the goods and non-asset markets, and it displays the long run characteristics of the monetary model, where prices and the exchange rate adjust equi-proportionally to a change in the money supply and purchasing power parity is maintained. The combination of sticky prices or sluggish output response and perfect capital mobility causes the exchange rate to temporarily overshoot its long run equilibrium. This, however, may not hold in the case of imperfect capital mobility. The DB model has been criticised for its assumption of the perfect substitutability of domestic and foreign assets, and a failure to incorporate the stock flow interactions arising from current account imbalances.

5.2.1.3 The Portfolio Balance Model

The portfolio balance models of exchange rate determination pioneered by Branson (1976, 1977, 1984) and Kouri (1976) stem from the work on portfolio theory and the demand for money by Markowitz (1952) and Tobin (1958). The central feature of the portfolio balance approach to exchange determination is that domestic and foreign non-money assets are assumed to be imperfect substitutes, as a result uncovered interest rate parity does not hold in this class of model. Thus, international investors will hold a diversified portfolio of non-money assets, the proportion of each asset in the portfolio depending on its particular risk-return characteristics. In addition, stock-flow interaction is also introduced into the PBM by making the demand for domestic money and assets depend upon the level of non-bank private wealth. Private sector wealth is accumulated and decumulated through current account surpluses and deficits, which in turn affects the exchange rate and the level of private sector wealth, which in turn feed back into private expenditures and the demand for money. The dynamic model is examined under both static exchange rate expectation and perfect foresight expectations respectively.

a. *Dynamic Model under Static Exchange Rate Expectations*²³

Total domestic nominal wealth, W , is made up of domestic residents' holding of domestic money, M , domestic residents' holdings of domestic bonds, B , and domestic residents' holdings of foreign currency assets, F^* . Domestic residents are assumed not to hold foreign currency, M^* . Therefore domestic non-bank private sector wealth, measured in domestic currency is defined as: $W = M + B + eF^*$, where e is the exchange rate defined in terms of the domestic price of foreign currency. The principal characteristics and the asset market equilibrium conditions for each of these three assets are given as equations in Appendix 5.3. Short run exchange rate determination is diagrammatically presented in Figure A5.3.1. The three asset market equilibrium equations can be achieved by intersection of the MM , BB and FF lines (see Figure A.5.3.1), which presents the short-run equilibrium levels of the exchange rate and the domestic interest rate. In fact, because of the wealth constraint, only two of the three market equilibrium equations are independent. Thus if a given change restores equilibrium in two markets, the third market must also be in equilibrium.

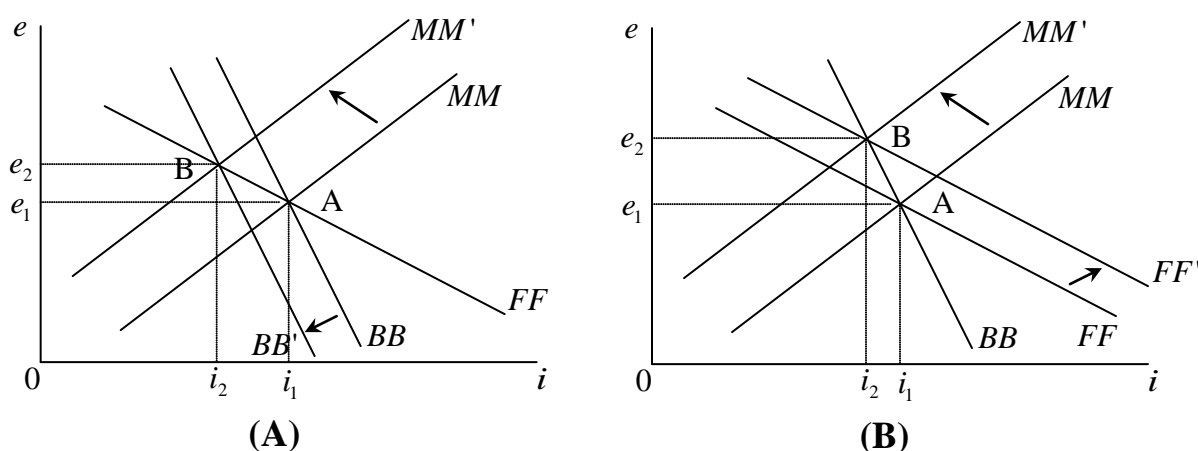
The short run impact of monetary policy can be represented in Figure 5.4. The result of the impact depends upon how the central bank has increased the money supply. In Figure 5.4A, suppose that the central bank expands the money supply by an open market purchase of domestic bonds in exchange for domestic money. At point A, the initial equilibrium, there will now be an excess supply of money and an excess demand for both foreign and domestic bonds. A large proportion of the new money goes to swell the demand for bonds, driving the interest rate down. It can be shown that the net effect is to cause both money and bond market lines to shift to the left. The MM line moves further than the BB line because the direct effect in the money market is greater than the impact on the bond market. Foreign assets become more attractive when the interest rate decreases,

²³ The model emphasized here refers to Pentecost (1993), "Exchange Rate Dynamics", Chapter 7, and Copeland (1994), "Exchange Rates and International Finance", Chapter 8.

this in turn increases the demand for foreign assets and requires a depreciation of the exchange rate.

Alternatively, the central bank can expand the money supply by buying foreign-denominated securities from domestic residents. Obviously, the impact on the MM schedule would be the same as in the previous case. On the other hand, the decrease in the value of the stock of foreign currency assets creates an excess demand which can only be offset by a depreciation of the exchange rate. Hence, the equilibrium moves up the BB schedule, with a fall in the interest rate and rise in the exchange rate as shown in Figure 5.4B.

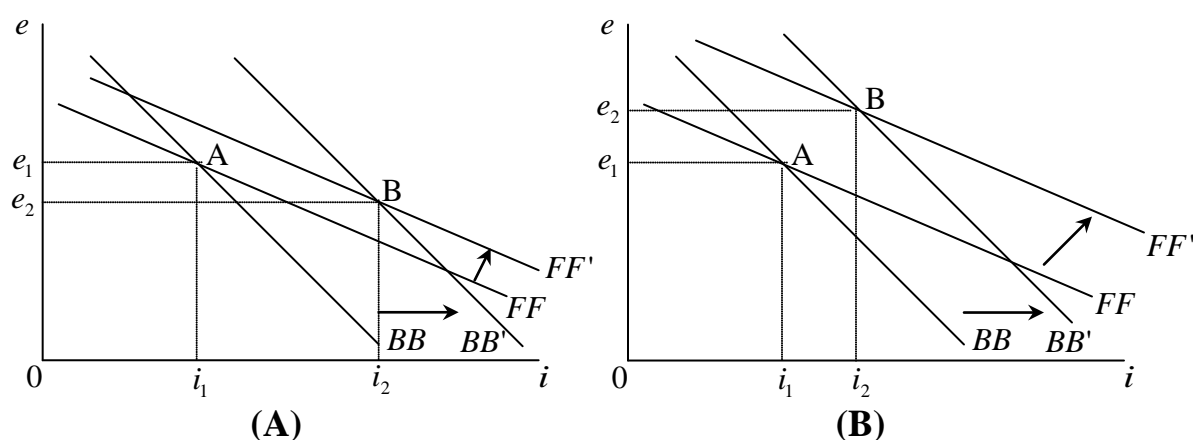
**Figure 5-4: Monetary Policy in the Short-run:
Open Market Purchase of Domestic and Foreign Bonds**



Consider now the effect of the fiscal expansion policy as illustrated in Figure 5.5. In the case of the increase in the domestic bond supply the interest rate will rise, but the exchange rate may rise or fall depending upon the substitutability of domestic and foreign bonds. Since the higher supply of bonds will lower domestic bond prices and increase the yield at each level of e , the BB schedule shifts out to the right to BB' . The higher level of wealth will lead to the purchase of foreign currency by domestic residents, which in turn will depreciate the domestic currency and leading to a rise in the exchange rate. Hence the FF line will shift up rightward in both cases of Figure 5.5. The extent of the shift in the FF line is important for the final effect on the exchange rate. First, if domestic and foreign

assets are close substitutes, then the rise in the interest rate will cause a substitution into domestic bonds which will dominate the wealth effect, leading to greater purchases of foreign bonds. In this case the shift in the FF line will be relatively small, as in Figure 5.5(A), and the net effect for the exchange rate will be a fall in the exchange rate (depreciation). Second, if domestic and foreign bonds are not very close substitutes then the wealth effect will dominate, making the demand for foreign bonds stronger and hence giving rise to a larger shift of the FF line to the right, as in Figure 5.5(B). In this case the exchange rate will decrease (it will appreciate).

**Figure 5-5: Fiscal Expansion Policy in the Short-run:
An Increase in Bond Supply**



b. *Dynamic Exchange Rate Expectations*²⁴

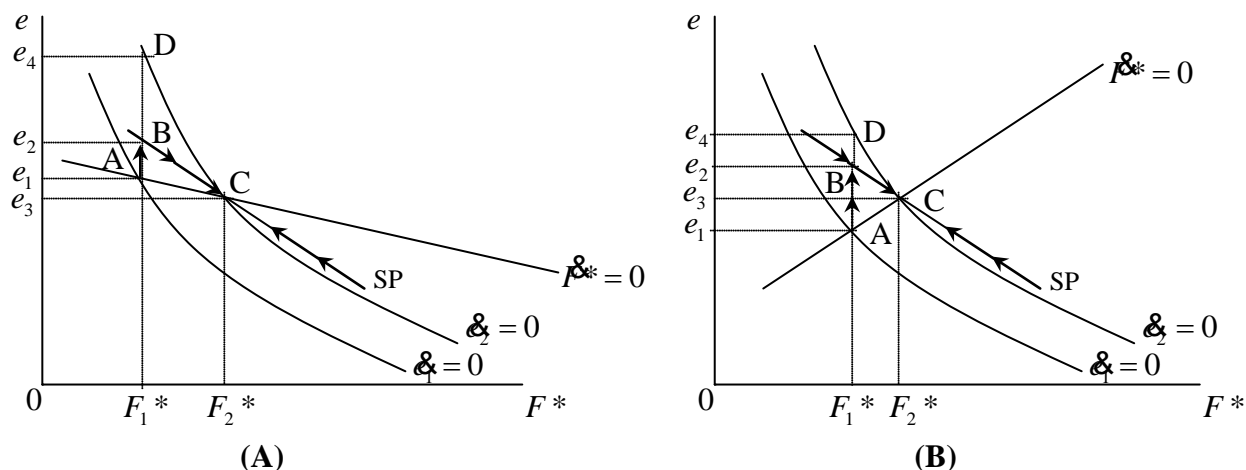
In the PBM model exchange rate dynamics require the specification of a wealth accumulation equation and a hypothesis about exchange rate expectations. Wealth accumulation is assumed to occur only through the purchase of foreign currency assets, since domestic asset stocks are assumed fixed and the government budget is balanced. The characteristics of the long run steady-state equilibrium are presented in Appendix 5.3.

Consider now the case of an increase in the domestic money supply by way of an open market purchase of domestic bonds. Figure 5.6 shows that the long run equilibrium

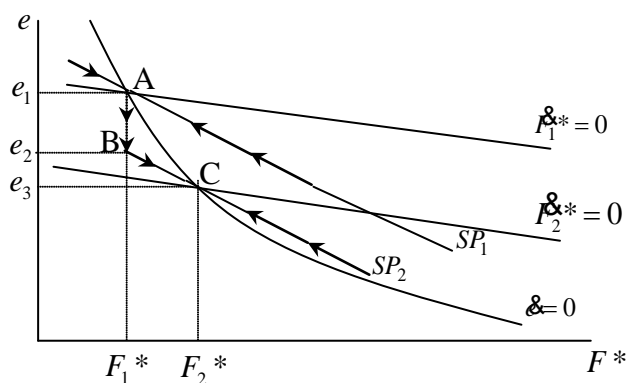
²⁴ The model emphasized here refers to Pentecost (1993), "Exchange Rate Dynamics", Chapter 7.

implications for the exchange rate differ according to the slope of the $\dot{R}^* = 0$ line. An unanticipated increase in the domestic money stock, due to an open market purchase, will shift the $\dot{R}^* = 0$ hyperbola up to the right. In Figure 5.6(A), where the \dot{R}^* locus has a negative slope, the exchange rate initially depreciates from e_1 to e_2 and then appreciates down the saddle path to the new long run equilibrium at e_3 . The net effect on the exchange rate is therefore an appreciation, as the initial steep depreciation gives rise to a trade surplus as domestic residents accumulate foreign assets. There are two points to be noted from this result. First, unlike the MF model, in the long run the exchange rate may appreciate in response to a domestic monetary expansion. Second, under perfect foresight expectations an unanticipated increase in the domestic money stock will lead to an immediate depreciation of the home currency, but this depreciation will not be as great as under static expectations. In this case perfect foresight expectations assist the adjustment of the foreign exchange market, because in the face of the initial depreciation rational agents will realise that this will improve the trade balance and generate a future appreciation of the domestic currency.

Figure 5.6(B) shows an equivalent monetary expansion with the $\dot{R}^* = 0$ line having a positive slope, reflecting the point that higher domestic wealth requires a depreciation of the exchange rate to maintain current account balance as domestic residents use their higher wealth to buy foreign goods. The rise in the money supply causes an immediate depreciation of the exchange rate from e_1 to e_2 , after which it partially appreciates back to e_3 , as the trade balance improves from the initial depreciation. In this case the long run equilibrium exchange rate is higher, at e_3 , than in the initial equilibrium. Thus an expansionary monetary policy has depreciated the exchange rate and this is consistent with the MF model.

Figure 5-6: An Open Market Purchase in the PBM with Perfect Foresight

Consider a shock to the current account, through a shift of the exogenous import parameter, IM . From an initial balanced-trade position a fall in IM will give rise to a trade balance surplus, hence requiring an appreciation of the exchange rate at all levels of F^* to maintain equilibrium. Thus the negative sloped $I_1^* = 0$ locus shifts down to the left to $I_2^* = 0$, as shown in Figure 5.7. From the initial equilibrium at point A the exchange rate jumps immediately down to B on the saddle path, which represents an appreciation of the exchange rate. The exchange rate then continues to appreciate along the stable arm until the new long run equilibrium is reached at point C. There is no short run overshooting of

Figure 5-7: Trade Balance Shock in the PBM with Perfect Foresight

the exchange rate in this case under perfect foresight or static expectations. The long run results would be unchanged in the case of the $I^* = 0$ line taking a positive slope.

Table 5.1 and 5.2 summarise the impact effects of the monetary, fiscal policies and external shocks on the financial and real sectors between the MF, DB and PBM models.

Table 5-1: Summarized Effects from a Monetary Expansion in the MF, DB, and PBM Models

Effects from a money expansion											
	The MF model				The DB model			The PBM model			
	Fixed exchange rate		Flexible exchange rate		Flexible exchange rate			Flexible exchange rate			
	Perfect capital mobility	Imperfect capital mobility	Perfect capital mobility	Imperfect capital mobility	Short run (on impact)	Long run		On impact	Short run	Long run	
						Adjustment process	Ultimate outcome			Adjustment process	Ultimate outcome
Real income	0	+	+	+	0	0	0	?	?	?	?
Price level	fixed	fixed	fixed	fixed	fixed	+	+	fixed	fixed	+	+
Nominal interest rate	0	-	0	-	-	+	0 ($i = i^*$)	-	-	?	?
Real interest rate	0	-	0	-	-	+	0	-	-	?	?
Nominal exchange rate + (depreciation) - (appreciation)	0	0	+	+	+	-	+	+	+	-	- or +
Real exchange rate + (depreciation) - (appreciation)	0	0	+	+	+	-	0 ($e \uparrow = p \uparrow$)	+	+	-	- or +
Balance of payments	0	0	0	0	0	?	?	0	?	?	0
Current account	?	?	?	?	0	?	?	0	+	-	0
Capital account	?	?	?	?	0	?	?	0	-	+	0

Note: + increases of the variables
 - decreases of the variables
 0 no change in the variables
 ? change in the variables not known, since not explicitly included

Table 5-2: Summarized Effects from a Fiscal Expansion in the MF, DB, and PBM Models

Effects from a fiscal expansion														
	The MF model				The DB model						The PBM model			
	Fixed exchange rate		Flexible exchange rate		Flexible exchange rate						Flexible exchange rate			
	Perfect capital mobility	Imperfect capital mobility	Perfect capital mobility	Imperfect capital mobility	Short run (on impact)		Long run				On impact	Short run	Long run	
							Adjustment process		Ultimate outcome				Adjustment process	Ultimate outcome
					Overshoot	Not overshoot	Overshoot	Not overshoot	Overshoot	Not overshoot				
Real income	+	+	0	+	+	+	+	+	+	+	?	?		
Price level	fixed	fixed	fixed	fixed	-	+	-	+	-	+	fixed	fixed		
Nominal interest rate	0	+	0	+	+	+	-	-	0	0	+	+		
Real interest rate	0	+	0	+	+	+	-	-	0	0	+	+		
Nominal exchange rate + (depreciation) - (appreciation)	0	0	-	-	-	+	+	+	-	+	+	- or +		
Real exchange rate + (depreciation) - (appreciation)	0	0	-	-	-	+	+	+	-	+	+	- or +		
Balance of payments	0	+	0	-	?	?	?	?	?	?	?	?		
Current account	?	-	?	-	?	?	?	?	?	?	?	?		
Capital account	?	+	?	+	?	?	?	?	?	?	?	?		

Note: + increases of the variables
 - decreases of the variables
 0 no change in the variables
 ? change in the variables not known, since not explicitly included

5.2.2 A critical look at the basic theoretical models

A critical look at these basic theoretical models can be specified under the following headings: fixed and sticky price, imperfect and perfect capital mobility, static and dynamic expectations, demand and supply side determination, current account equilibrium and wealth effects.

5.2.2.1 *Fixed and Sticky Price*

In the MF model, the price level is simply an exogenously fixed index which can have no role to play in the domestic macroeconomy. With this distinctive feature in the model there is neither a price response to a monetary shock nor feedback from a depreciation or appreciation of the exchange rate via import prices to domestic prices. Hence the purchasing power parity (PPP) condition does not hold, even in the long run. In the DB model the price level is fixed only in the short run due to the inherent rigidities that are so typical of markets for labour and goods, but it rises during the adjustment process arising from the excess demand in the goods market. Goods prices, which are sticky, response to market disequilibria by a factor π (see A5.2.1), but not fast enough to eliminate those disequilibria instantly. The goods market adjusts slowly and remains in disequilibrium throughout the adjustment process, whilst the exchange rate and interest rate are assumed to instantaneously adjust following a disturbance ensuring that the asset markets is permanently in equilibrium. For the PBM model, as the model is a partial equilibrium model, the price adjustment process has not been mentioned.

In both the DB and PBM models a monetary disturbance can lead to exchange rate overshooting, meaning that PPP does not hold in the short run. However, each has its own explanations for the overshooting phenomenon. Sticky prices in the short run cause exchange rate overshooting in the DB model, whilst the PBM model gives a reason that changes of wealth via balance of trade disequilibrium need time. In addition, the important

difference between these two models is that while the PPP condition does hold in the short run in the DB model, in the PBM model this does not hold in both the short and long run. A monetary expansion with a flexible domestic price response in the long run will tend to be associated with an exchange rate appreciation, and hence the non-PPP model represents a more radical departure from the PPP-based DB model.

5.2.2.2 Imperfect and Perfect Capital Mobility

Capital can only be considered perfectly mobile if it can be moved into the preferred form of investment any time without delay and in the desired amount. The extent to which capital is mobile determines how quickly the long run equilibrium value is approached. If capital is perfectly mobile the market clears instantaneously, and short run and long run responses are identical. When mobility is less than perfect, however, the market needs time to adjust to its new long run equilibrium. In the MF model, one of its advantages is that both cases of perfect and imperfect capital mobility assumptions can be analysed. The assumption of perfect capital mobility implies that, if expectations are assumed to be static (that is, the expected change in the exchange rate is equal to zero) and arbitrage is assumed to ensure that bond yields are continually equalised, the domestic rate of interest must continually equal the foreign rate ($i = i^*$). In this case the capital account and the balance of payments can be in equilibrium and hence the balance of payments (BP) curve is horizontal. From these assumptions the conclusion of the MF model is that the choice of the exchange rate regime and the degree of capital mobility determines the relative effectiveness of monetary and fiscal policy. However, in the DB model only the perfect capital mobility case is analysed.

In contrast with the MF and DB models the PBM model assumes that domestic and foreign non-money assets are imperfect substitutes. This assumption implies that the uncovered interest rate parity (UIP) condition does not hold in the PBM model because investors will hold a diversified portfolio including non-money assets, and the proportion of each asset in the portfolio depends on its risk-return characteristics. Imperfect substitutes

in the PBM model means that not only must we consider the equilibrium of the money and domestic bond markets but also to pay attention to changes in relative demands and supplies in the foreign bond market, which will disturb portfolio equilibrium and influence exchange rate behaviour.

5.2.2.3 *Static and Dynamic Expectations*

In the MF model there is no role for exchange rate expectations. Capital movements are solely a function of the interest rate differential between the domestic economy and the rest of the world, taken to measure the differential yield on the respective assets. However, another component in the prospective asset yields is the expected capital gain/loss through expected exchange rate variations. Whilst expectations play a crucial role in many theories of the exchange rate, the neglect of this in the MF model is a fundamental criticism of this approach.

The difference between the MF and DB models is that in the DB model capital movements are not solely dependent on the interest rate differential but exchange rate expectations also play an important role in determining capital flows. The interest rate differential domestic and world markets will reflect the expected rate of depreciation or appreciation of the domestic currency. If the domestic currency is expected to depreciate then financial markets demand a higher rate of return on domestic currency denominated asset holdings, in other words the domestic interest rate is higher than foreign interest rate, and vice versa.

In the DB model exchange rate expectations are assumed to be regressive, and hence the expected change in the exchange rate depends upon the difference between the current exchange rate (e) and the equilibrium exchange rate (\bar{e}). If (e) exceeds the equilibrium value then there is an expectation that (e) will appreciate (fall) back to the equilibrium level. Similarly, if the current value is below the equilibrium value then it is expected that the rate will depreciate (e will rise) back to the equilibrium. The relaxation of the static expectations assumption has implications for policy shocks and allows policymakers to

analyse the impact of policy shocks in different time periods, short run, medium run and long run. Exchange rate expectations are assumed to be perfect foresight expectations, which means that the expected change in the exchange rate next period based on information available in this period is exactly the change which occurs. That is $E(\Delta s) = \Delta s$, so that the UIP condition is $i = i^* + \Delta s$. The assumption of rational expectations allows the model to make the distinction between policies which are anticipated and those which are unanticipated, and this in turn has important implications for the effectiveness of monetary and fiscal policies.

In the PBM model the domestic interest rate can diverge from the world interest rate not only because of exchange rate expectations as in the DB model, but also because of risk premium ($i - i^* = E(\Delta s) + rp$).

5.2.2.4 Demand and Supply Side Determination

The three models reviewed above emphasise only the demand side of the economy and neglect the supply side. The MF model assumes the aggregate supply curve is flat, which implies that the burden of adjustment to aggregate demand fluctuations falls on the level of real output rather than on the price level. The DB model also puts emphasis on the demand side of the economy in which output supply is fixed at the full employment level, and hence fluctuations in goods demand only results in price movement and not in output movement. However, although the supply side is not directly incorporated in the PBM model, the model can be extended to allow for changing capital stock accumulation in both the public and private sector, which in turn will affect the production function and therefore aggregate supply. This will be attempted in designing a macroeconomic model of Vietnam in the next section.

5.2.2.5 Current Account and Wealth Effects

The consistency of a non-zero current account with long run equilibrium has been regarded as a point of weakness in the MF and DB models. If the current account is not in equilibrium it will affect the stock of foreign assets and therefore financial wealth, which in turn will have implications for expenditure on goods and the asset demand function and thus the equilibrium in these two models can only be temporary. However, this shortcoming is remedied in the PBM model by incorporating the current account into the analysis. The PBM model requires for overall equilibrium that the current account has to be in balance, and to ensure that the current account is restored to balance in the long run it is necessary for the real exchange rate to have appreciated (in the case of monetary expansion) in the long run equilibrium. This is because the current account surplus, which is generated by an initial monetary expansion, results in an accumulation of foreign assets on the service component of the current account, thus tending to push the current account further into surplus. For the current account balance to achieve long run equilibrium requires an appreciation in the real exchange rate so that there is a worsening of net exports in the trade account to offset an increase in net investment income in the service account. The eventual real exchange rate appreciation is determined by the cumulative size of the current account generated between equilibrium positions and hence accumulation of foreign asset stocks.

In the MF and DB models, although the current account plays a leading role in the adjustment mechanism, no account is taken of the wealth effects, either on portfolio allocation or on real expenditure. The inclusion of wealth effects in asset and goods markets has been considered to be an important feature in exchange rate theory. A current account surplus, and increasing domestic wealth, will increase the demand for money and other domestic assets and, in addition, may directly affect domestic expenditure through wealth effects on consumption. Through these mechanisms the current account will influence the exchange rate and, possibly domestic real income, which in turn will feed

back onto the current account, until the model is in full equilibrium once the current account is brought back into balance.

Although these three models have a number of shortcomings, and their focus has been placed on mainly monetary and fiscal policies, they can provide the basic building blocks of a dynamic macroeconomic model for transition economies, particularly for the Vietnamese economy. However, there is a need to have some amendments so that the model developed can be used for analysing macroeconomic and reform policies that are specific to Vietnam such as that of trade liberalisation, state-owned enterprise privatisation or restructuring, and expansionary public investment. The development of such a model is the basic purpose of the present study.

5.3 A Macroeconomic Model for Vietnam

Based on the models previously presented, and combined with the contributions of Harvie and Lee (1996) (HL) and Harvie and Kearney (1996) (HK) this section will develop a macroeconomic model which can allow an analysis of the macroeconomic adjustment processes arising from structural reform policies, and exogenous shocks emanating from trade and financial liberalisation, for a small transition economy such as Vietnam's. Before presenting the model the key assumptions underlying the theoretical model will be discussed first.

5.3.1 The major assumptions of the model

Similar to the DB, HL and HK models the model developed for Vietnam assumes a deterministic framework in which economic agents possess rational expectations, and this is equivalent to the case of perfect foresight. Importantly, financial markets are assumed to be in continual equilibrium because of the ability of financial variables to adjust instantaneously, while non-financial markets can remain in disequilibrium throughout the adjustment process because of the presumed stickiness of price and quantity adjustment.

However, there are some points that make the HL and HK models, and also the model developed in the present study, different from DB's but similar to PBM's. First, while the DB model focuses upon the short run, and does not explicitly consider the role of the current account during the adjustment process, these models, like the PBM model, emphasise the long run nature of the adjustment process, in which the need for long run equilibrium in the current account is explicitly incorporated as well as the wealth effects from the flow of foreign asset stock holdings which arise from current account developments. Second, while in the basic theoretical models focus is placed solely upon the demand side, the model developed in this study, similar to the HL and HK models, will focus upon both aggregate demand and supply. In the case of the supply side output is not restricted to remaining at some natural level of output, appropriate in the context of a short run framework, but rather output supply can vary through the process of capital stock accumulation. Finally, other extensions include Tobin's q theory of investment, emphasis on the important role of wealth effects during the adjustment process, the incorporation of additional financial assets and the introduction of both sticky price and quantity adjustment of non-financial variables.

The model developed for Vietnam will also contain other major assumptions underlying the HL and HK models, which can be summarised as follows: the reform policies²⁵ will have an impact upon the economy indirectly through their effect on the real exchange rate and also directly through capital stock accumulation and the trade balance, which include a change in domestic output and foreign assets generated from the reform policies; the domestic economy produces goods which can be consumed domestically and are an imperfect substitute for the imported goods; and, finally, the economy operates under a fixed nominal exchange rate with extensive government control over the capital market. This last assumption is ultimately abandoned and replaced by a flexible exchange

²⁵ The reform policies emphasised here are: (a) nominal exchange rate devaluation, (b) tariff reduction, and (c) privatisation of the SOE capital stock.

rate and perfect capital mobility, with the objective of conducting a comparison of the effects of the reform policies upon the domestic economy under two exchange rate regimes.

Moreover, with the aim of looking at the issues of the speed and sequencing of reforms applied in transition economies, and especially for the case of Vietnam, the development of an appropriate macroeconomic model requires extensive refinement and extensions to the existing HL and HK models. These are as follows.

(1) The model developed is for Vietnam, a small transition economy, incorporates a significant presence of SOEs, which often provide the dominant mode of organisation in large scale and heavy manufacturing (steel, power, cement) as well as in the financial and distribution sectors. In 1995 in Vietnam, for instance, SOEs were estimated to account for around 30 per cent of non-agricultural employment, and 43 per cent of non-agricultural value added (Ghosh and Whalley, 2000). Thus, the model will explicitly distinguish the contributions of both SOEs and the private sector to domestic aggregate supply. This is conducted to examine the impact of the privatisation policy. It is assumed that the private sector is more efficient than the public sector and that the privatisation of SOE capital stock means that the capital of SOEs is simply given to the private sector, and as a result the private capital stock and private wealth will increase. Privatisation is assumed to be introduced either gradually or immediately. This assumption would lead to different adjustment paths for the economy. Particular focus is given to the case of privatisation since the Vietnamese economy is changing towards a market-oriented one in which the private sector is expected to make a larger contribution to total output.

(2) The model developed initially assumes that the nominal exchange rate is fixed, and that there is significant government control over international capital mobility. Unlike other transition economies in Europe, Vietnam's financial markets are still rudimentary and in the process of being liberalised. Imperfect capital mobility implies that the return on domestic financial assets is not equated continuously with that on foreign assets. This is a second amendment of the basic theoretical model upon which the model developed and presented here is based.

These assumptions will be gradually relaxed during the macroeconomic adjustment process. Government control over international capital mobility will be increasingly reduced, and abandoned when full liberalisation is adopted by the Vietnamese government. At the same time a change in the nominal exchange rate regime from fixed to flexible is also examined. These assumptions are of contemporary relevance for Vietnam, since its integration with the global market economy through, first, being a member of AFTA in 1996, and, second, signing a bilateral trade agreement with the US in 2001, and then, third, possible membership of the WTO in 2005. These assumptions allow the recognition of appropriate policies in regard to changing the nominal exchange rate regime and capital controls, and their implications for the adjustment process arising from trade and financial liberalisation for Vietnam. In the context of the model a comparison of the impact of the reform policies applied under two exchange rate regimes will be conducted in Chapter 7, in order to identify an appropriate exchange rate policy for the case of Vietnam.

(3) It is assumed that government spending consists of consumption and investment spending. Government investment spending on infrastructure development contributes to the level of aggregate demand for output as well as affecting output supply, while government consumption spending only affects the level of aggregate demand for output arising from increased salaries in the state sector. The distribution of government expenditure between consumption and investment is primarily politically determined, and in the context of the model is assumed to be exogenous. Alternative spending options, combined with the reform policies, allow the identification of an appropriate policy that would enhance the level of aggregate demand and supply.

A main objective of this study is to identify the implications of alternative policies, such as privatisation and the restructuring of SOEs, trade and financial liberalisation, and an expansion of government infrastructure expenditure for the economic development of the economy. Although there are many other reforms that can be examined, these three should give a sense of the important lessons to be drawn from the model developed here for

the case of Vietnam. These policy implications form the basis of the simulation scenarios to be discussed further in Chapter 7.

The equations of the model are now presented, as with the HL and HK models, they are categorised under five headings; goods market, assets market, foreign sector, price/wage nexus, and definitions. All equations in the model, except for the domestic nominal interest rate and the world interest rate, are presented in log-linear form²⁶. The symbols are defined in the box following the equations.

²⁶ The original Dornbusch (1976), HL and HK (1996) models have all adopted this log linear approach. As the equations are in log form the estimated parameters are equivalent to elasticities. This is very **useful** in identifying the percentage changes in endogenous variables arising from percentage changes in exogenous variables, especially for the simulation analysis we can plot the percentage deviation of an endogenous variable from its baseline value throughout the adjustment process.

The Base Model

Goods Market

$$y^d = \alpha_1 c^p + \alpha_2 i + \alpha_3 c^s + \alpha_4 i^s + \alpha_5 (tx - tm) \quad (1)$$

$$c^p = c_1 y^s + c_2 w^p \quad (2)$$

$$i = \beta i^p + (1 - \beta) i^e \quad (3)$$

$$i^p = \dot{k}^p = \tau_1 \dot{k}^{p*} - \tau_2 \dot{k}^p \quad (4)$$

$$\dot{k}^{p*} = \eta q \quad (5)$$

$$i^e = \dot{k}^e = \varphi(k^{e*} - k^e) \quad (6)$$

$$i^s = \dot{k}^s = \theta(k^{s*} - k^s) \quad (7)$$

$$c^s = c^{\bar{s}} \quad (8)$$

Assets Market

$$m = p + \omega_1 y^d - \omega_2 r + \omega_3 w^p \quad (9)$$

$$w^p = \mu_1 (f + e - p) + \mu_2 (m - p) + \mu_3 (k^p + q) \quad (10)$$

$$\dot{m} = dce + \psi(r - r^w + \dot{f}) \quad (11a)$$

$$e = r - r^w \quad (11b)$$

$$\dot{q} = \delta_3^{-1} \{q - \delta_1 R + \delta_2 (r - \pi)\} \quad (12)$$

$$R = \varepsilon_1 y^s - \varepsilon_2 k^p - \varepsilon_3 k^e + \varepsilon_4 k^s \quad (13)$$

Foreign Sector

$$tx = \sigma_1 y^w + \sigma_2 (e - p) - \sigma_3 T \quad (14)$$

$$tm = \tau_1 y^d - \tau_2 (e - p) - \tau_3 T \quad (15)$$

$$\dot{f} + \dot{q} - \dot{p} = \rho_1 (tx - tm) + \rho_2 (r^w f + e - p) \quad (16)$$

Price/wage Nexus

$$p = \alpha w + (1 - \alpha)e \quad (17)$$

$$\dot{p} = \phi_1 (y^d - y^s) + \phi_2 \pi \quad (18)$$

$$y^s = \lambda_1 k^p + \lambda_2 k^e + \lambda_3 k^s - \lambda_4 (w - p) \quad (19)$$

Definitions

$$t = tx - tm \quad (20)$$

$$\dot{m} = \pi \quad (21)$$

$$c = e - w \quad (22)$$

$$l = m - w \quad (23)$$

A dot (.) above a variable signifies its rate of change.

List of Symbols

Endogenous variables		Exogenous variables	
y^d	Aggregate demand for output	c^g	Government consumption spending
c^p	Private consumption	e	Nominal exchange rate
i	Total investment	y^w	World real income
i^g	Government investment spending	r^w	World interest rate
tx	Total exports	dce	Domestic credit expansion
tm	Total imports	T	Trade protection (tariff imposed on exports and imports)
i^p	Domestic private investment		
i^e	SOE investment		
k^e	SOE capital stock		
k^p	Private capital stock after the privatisation policy is applied		
$k^{p'}$	Private capital stock		
k^g	Public capital stock		
m	Nominal money supply		
p	Domestic price level		
r	Domestic nominal interest rate		
w^p	Private real wealth		
w	Domestic nominal wage		
f	Foreign asset stock		
q	Tobin's q ratio		
R	Real profits		
y^s	Aggregate supply of output		
\mathcal{F}	Current account balance		
c	Real exchange rate		
l	Real money balances		
π	Inflation expectation		
t	Trade balance		

Equilibrium in the model depends on equilibrium in the goods market, assets market, and foreign sector. Equilibrium in the goods market will be discussed first.

The goods market equilibrium consists of eight equations. The first two equations are the same as those in the HL and HK models. Aggregate demand for output (y^d) is given by Equation (1). In this study, aggregate output demand comprises private consumption, total investment, government consumption, government capital investment and the trade balance

consisting of exports less imports. Equation (2) indicates that private consumption expenditure depends positively on the level of real income²⁷, (y^s), and real private sector wealth, (w^p). Equation (3), total investment, consists of two components: private sector investment (i^p) and state-owned enterprise investment (i^e).

Equations (4), (5), (6) and (7) explicitly explain capital investment in the model. Private sector investment is also explicitly modelled as in Equations (4) and (5). Equation (4), consists of net private investment and SOE capital stock given to the private sector arising from the privatisation process. Equation (5) gives the net private investment equation, which captures the partial adjustment hypothesis where the capital stock adjusts gradually to its new optimal level. Equation (5a) captures this partial adjustment hypothesis:

$$\dot{k}^* = \eta(k^* - k) \quad (5a)$$

where k^* represents the desired capital stock and k the actual capital stock. Assuming costs of adjustment, the gap is closed only by η for each period. The desired capital stock depends upon its market value as given by (5b)

$$k^* = k + q \quad (5b)$$

Substituting (5b) into (5a) Equation (5) can be obtained. Hence net private investment adjusts positively to Tobin's q .

State-owned enterprise investment arises from a gradual adjustment of the actual SOE capital stock (k^e) to its policy-determined level (k^{e*}), as in Equation (6). It is assumed that the decrease in the SOE capital stock, caused by the privatisation policy, is policy determined. These major differences from the basic models emphasise the important policies of government in regard to restructuring SOEs and stimulating the development of the private sector. Identifying this issue for the Vietnamese economy is one of the main objectives of this study²⁸. Government capital spending arises from a gradual adjustment of

²⁷ Real income is measured as domestic aggregate supply rather than domestic aggregate demand because aggregate supply specifies domestic production of goods and services, and therefore domestic income generated. This is a major variable influencing consumption expenditure.

²⁸ More details will be presented in Chapter 7 when a simulation of the model is conducted.

the actual public capital stock (k^g) to its policy determined level (k^{g*}), as in Equation (7), while government consumption spending is an exogenous policy determined variable (Equation (8)). Identifying the contribution of government investment to the development of the domestic infrastructure system for the Vietnamese economy is another key objective of this study. These two equations are the same as those in the HK model.

Assets market equilibrium, given by equations (9)-(13), is fundamentally based on the base models presented in the last subsection. There are four financial assets here, these being domestic money, domestic bonds, foreign bonds, and equities. The latter represents claims to the ownership of the capital stock in the private sector. Domestic financial assets are assumed to be perfect substitutes, with arbitrage between them resulting instantaneously in the same expected rate of return. However, due to the assumption of imperfect international capital mobility, the return on domestic financial assets is not continuously equated with that on foreign assets (bonds). Only gradually will the return on these financial assets be equated. This assumption, based on the HL model, makes the model developed more suitable to the characteristics of the Vietnamese economy as previously presented.

Equation (9) represents the demand for real money balances, which depends positively on the level of aggregate demand (y^d) and domestic private real wealth (w^p), and negatively on the domestic nominal interest rate (r). Real domestic private sector wealth, which is given by Equation (10), as in the HL and HK models, depends positively on the real domestic currency value of domestically held foreign assets (f), on holdings of real money balances ($m - p$), and on the real value of the domestic capital stock ($k^p + q$).

Equation (11a) identifies the balance of payments condition with a fixed exchange rate and imperfect capital mobility. With the nominal exchange rate fixed the money stock becomes an endogenously determined variable in the model. The assumption of imperfect capital mobility produces a discrepancy between the return on domestic financial assets and foreign financial assets, which can persist for a prolonged period of time. With a fixed exchange rate expected returns on domestic and foreign financial assets are not equalised,

and divergences in the returns on these will lead to changes in capital inflows or outflows. Such flows will affect domestic reserves and have an impact upon the domestic money supply growth, resulting in changes in inflation.

In the case of a fixed exchange rate the money supply is endogenously determined. It depends on increases in the domestic component of the money supply, described here as the exogenous domestic credit expansion (dce), and the change in foreign exchange reserves by the central bank, which are endogenously determined by balance of payments surpluses or deficits arising from a fixed nominal exchange rate and developments in the current account and capital flows, as shown in Equation (11a).

$$\dot{M} = dce + \psi(r - r^* + f)$$

Capital flows depend on the difference between the domestic nominal interest rate and the world interest rate, while the current account position is indicated by the accumulation/decumulation of foreign exchange reserves. With a fixed exchange rate there will be a balance of payments surplus or deficit resulting in an accumulation/decumulation of foreign exchange reserves, and a consequential increase/decrease in the growth of the domestic money supply.

Under a flexible exchange rate regime the nominal exchange rate can adjust, so that either capital inflows or outflows will have no effect upon foreign exchange reserves. As a result the growth of the money stock is exogenous, and the nominal exchange rate becomes endogenous. Hence Equation (11b) is relevant with the assumption of a flexible exchange rate combined with perfect international capital mobility.

Equation (12) represents equilibrium in domestic non-money asset markets. The return on all non-money financial assets is assumed to be maintained continuously through arbitrage in the case of a flexible exchange rate, while in the case of a fixed exchange rate only the return on domestic financial assets is assumed to be equated continuously. The expected real return on holding equities is given by:

$$\dot{P}/P + R/P$$

The expected return on equities depends upon the expected capital gain/loss from holding equity capital (\dot{q}/q) plus the real profit stream derived from the capital service R (profit) relative to q .

Continual, and instantaneous, arbitrage between domestic bonds, foreign bonds and equity capital implies:

$$\dot{q}/q + R/q = r - \pi = r^* + \dot{\pi} - \pi$$

Ignoring $(r^* + \dot{\pi} - \pi)$, since this must be equivalent to $(r - \pi)$, and taking a log linear approximation, it can be solved for q :

$$q = \delta_1 R - \delta_2 (r - \pi) + \delta_3 \dot{q}$$

or re-arranging and solving for \dot{q} , Equation (12) is obtained.

Equation (13) defines the real return on capital services, which depends positively on the level of real income, and negatively on the stocks of SOE and private capital (k^e, k^p) due to diminishing returns, and positively on public capital (k^s). The latter holds because it is assumed that public capital may crowd in other capital and the productivity of other capital rises as the government provides more public capital stock. Hence the public and private capital stocks are assumed to be complementary.

Foreign sector equilibrium consists of three equations, as presented in Equation (14)-(16). Total exports are given by Equation (14). It depends positively on world real income, the real exchange rate, and negatively on exogenous world trade protection. Equation (15) represents total imports, which depend positively on real domestic income and negatively on the real exchange rate and exogenous domestic trade protection.

Equation (16) defines the current account of the balance of payments, which is equivalent to the change in domestic holdings of foreign assets. This equation indicates that the accumulation of foreign bonds (or asset stocks) depends on the trade balance ($t = tx - tm$)²⁹, and real foreign interest income ($r^* f + e - p$). In the long run steady state

²⁹ If the trade balance and current account balance are negative, with the log-linear forms they cannot be calculated. To change from a negative to a positive number the weighted calculation for these variables will be applied.

the current account balance must be zero, otherwise further wealth effects will arise which in turn requires further macroeconomic adjustment.

The wage-price nexus and aggregate supply are given by equations (17)-(19). The domestic price, Equation (17), is a weighted average of domestic nominal wages and the world price of the imported goods. Nominal wages, Equation (18), adjust in line with a simple inflationary expectation (π) augmented Phillips curve. Aggregate supply, as represented by Equation (19), is derived from a production function which includes labour (which is assumed homogeneous between the private and government sectors and earns the same wage in both sectors), the SOE and private as well as public capital stocks.

Finally, equations (20)-(23) are defined as follows. Trade balance is measured by the difference between exports and imports in equation (20). Inflationary expectations, as given in Equation (21), are assumed to adjust instantaneously with the domestic monetary growth rate. Equations (22) and (23) define two variables which are used extensively throughout this model, the real exchange rate (c) and real money balances (l) respectively.

5.3.2 Alternative approaches of the economic reform policies

The model developed above will be used to analyse the implications of two alternative paths of economic reform policies. In the first, the country moves gradually by selectively introducing reforms and spacing them over time. In the second the country pursues a “Big Bang” approach, by which the government immediately and simultaneously introduces the reforms. The focus is on the speed of introducing a limited number of policy and reform variables: (i) privatisation; (ii) nominal exchange rate devaluation; (iii) tariff reduction; and (iv) fiscal expansion. All these reform policies will also be conducted in the context of a flexible exchange rate version of the model.

5.3.2.1 Privatisation of SOE capital stock

This policy deals with an analysis of the effects of SOE privatisation and restructuring policies on the Vietnamese economy. In this case there is no amendment to the base model, except for varying the parameter values in respect to the share of the SOE and private capital stock in domestic capital investment as described in Equation (4). A simple form of privatisation of the SOE capital stock will be implemented. That is, when the government privatises SOEs, it simply gives the capital of the state enterprises to the private sector. This change, as discussed in more detail later, will have a positive impact on economic development.

If $\tau_2 = 0$ in Equation (4), this implies that private investment, which equals the change in the stock of private capital (\dot{k}^p), depends totally on Tobin's q ratio, while if $\tau_2 > 0$ this means that there exists an allocation of capital stock from SOEs to the private sector. Privatisation requires varying the policy-determined parameter (k^{e*}) as described in Equation (6). This parameter will be smaller than zero as the privatisation policy is applied. These alternative possibilities will be discussed in Chapter 7.

5.3.2.2 Trade liberalisation policies

These policies deal with varying the nominal exchange rate and the degree of tariffs on exports and imports. The effects of trade liberalisation on the Vietnamese economy will be examined under these alternative policies. There is no modification to the base case except for varying the nominal exchange rate (e) in Equations (10), (14), (15), (16) and (17), and the change in tariffs (T) on exports and imports as indicated in Equations (14) and (15). These variables are treated as exogenously determined. The parameter of the nominal exchange rate (e) in these equations can range from less to more. If it is more than zero this implies that the nominal exchange rate devaluation policy is applied, while if this parameter is less than zero this implies that the nominal exchange rate appreciation policy is adopted.

For the tariff reduction policy, the parameter values σ_3 (Equation (15)) and τ_3 (Equation (16)) can range from zero to one. A rise in each parameter value means an increase in trade barriers or protection (both domestic and international). If $\sigma_3 = 0$, this implies that there is no world trade barrier. Consequently, this should lead to an improvement in Vietnam's exports to the rest of the world, while if $\sigma_3 = 1$ this means that the world trade barrier is fully imposed and presents a complete obstacle to Vietnamese's exports. A similar explanation holds for the parameter τ_3 : if $\tau_3 = 0$ this means that there is no domestic trade barrier resulting in an increase in imports from the rest of the world to Vietnam, but if $\tau_3 = 1$, this implies that the domestic trade barrier is fully imposed on Vietnam's imports. These alternative options will be further discussed in Chapter 7.

5.3.2.3 *Alternative public infrastructure spending policies*

Another important alternative policy deals with an analysis of the impact of government capital expenditure on infrastructure development. In this case there is no amendment to the base case except for varying the policy determined variable (k^{g*}) (Equation (7)). The policy determined variable (k^{g*}) can range from less to more. If the parameter of (k^{g*}) (θ) is greater than zero, this means that the government adopts expansionary public capital spending on infrastructure, while if this parameter is less than zero this implies that the government adopts a contractionary fiscal policy.

5.4 Conclusions

This chapter has outlined three basic theoretical models contributed by Mundell-Fleming (1963), Dornbusch (1976) and Branson (1977, 1984), which, although they have not been developed specifically to look at a transition economy, can provide the basic building block for developing a dynamic macroeconomic model for Vietnam as a transition economy. Based on these three models, and also the contributions of Harvie and Lee (1996) and Harvie and Kearney (1996), a dynamic macroeconomic model (see p. 228)

emphasising the long run for the case of Vietnam is developed. This model will be used to analyse the macroeconomic adjustment process arising from a variety of shocks emanating from the period of transforming to a market economy for Vietnam.

In this study it is assumed that the domestic economy produced output that is consumed domestically and is an imperfect substitute for the imported good equivalent. The price of these goods is domestically determined. The deterministic framework of the model combined with economic agents possessing rational expectations, is equivalent to the case of perfect foresight. Financial markets are assumed to be in continual equilibrium, while non-financial markets are subject to sticky price and quantity adjustment. The model developed focuses on the long run nature of the dynamic adjustment process, because the macroeconomic adjustment process arising from the reform measures focused upon will exert a long run effect on the Vietnamese economy. This arises from allowing for physical capital stock accumulation and developments in the current account balance. It is assumed in the model that private and government capital spending contributes to an expansion of the physical capital stock in the real sector, improving the productivity capacity of domestic output, whilst SOE capital spending steadily declines resulting from privatisation and restructuring.

The model developed is used to analyse the implications of two alternative paths of economic reform for an economy with a large public sector that is being transformed to become more market oriented such as Vietnam. The reform policies emphasised, in particular, relate to that of SOE privatisation and restructuring, trade liberalisation, and public infrastructure capital spending. These three policies will be discussed and presented in Chapter 7. The next chapter will conduct an estimation of the model's parameters based on Vietnamese data.

CHAPTER 6

EMPIRICAL ESTIMATION OF THE MODEL

6.1 Introduction

In the last chapter the analytics of the base model for macroeconomic policy analysis was developed. The objective of this chapter is to estimate this model for Vietnam using econometric techniques, and to use the estimated coefficients for the conduct of a simulation analysis of various policy measures and their impact on the macroeconomic adjustment of the Vietnamese economy. Time series data, taken from many sources for Vietnam (see below), are used to estimate the model that we believe reasonably well captures the dynamic interaction between the product, financial and labour markets. The behavioural equations are first estimated using a simple method – Ordinary Least Square (OLS) regression. The analysis of these results, based on diagnostic test statistics including t - values, the Durbin-Watson (DW) statistic, F - values and the coefficient of determination (R^2) of the regression, allows identifying whether the regressions conducted and the results obtained are acceptable.

Since the traditional OLS approach to modelling ignores the temporal properties of the data, the re-examination of the model requires techniques that account for time series data that is inherently non-stationary. Determining whether the variables are stationary or non-stationary is done by testing the null hypothesis that each variable included in the model contains a unit root. The unit root tests using the Augmented Dickey-Fuller (ADF) approach help to determine the integration orders of the time series used. If all variables are integrated of order one $I(1)$, the conduct of cointegration tests will be the next step for the possible determination of both long-run and short-run relationships among the variables involved. The theory of cointegration (Granger, 1981, 1986; Engle and Granger, 1987) deals with causation between economic variables, focusing particularly on long-term relationships. The combination of long-run information and a short-run adjustment

mechanism is presented in the error correction model (ECM) proposed by Granger (1988). All these econometric modelling approaches will be applied to estimate the model developed for Vietnam.

However, all these estimation methods have been justified on asymptotic grounds, which might be applied comfortably when the sample sizes are very large. In the case of Vietnam, where the sample size is limited by 16 observations, it is obvious that the aforementioned approaches may not give reliable results. Thus, in order to assess the accuracy of the obtained results from conventional approaches, this chapter also applies the bootstrap method, initiated first by Efron (1979), that is used for the correction of a small finite sample size.

The arrangement of this chapter is laid out as follows. Section 6.2 describes the data sources and the econometric methods used to estimate the model. Section 6.3 presents the results of the OLS estimation. Tests for unit roots are then described and conducted in Section 6.4. In this section, a cointegration analysis is also used to examine the long-run relationship among the variables of interest. Then an error correction model will be undertaken, since it can characterise the nature of the short run dynamic adjustment towards the long run equilibrium. Section 6.5 gives a brief review of the bootstrap idea, pinpoints the technique issue to be addressed by the bootstrap relating to the OLS, and unit root tests, and applies these ideas to the equations of the developed model. Concluding remarks are presented in Section 6.6.

6.2 Data Sources and Econometric Methods

The model developed utilises a number of macroeconomic variables that have been obtained from a number of sources. Statistics on GDP, private and state consumption, total investment, capital stock, total exports and imports were collected from the General Statistics Office (GSO) of Vietnam, and the annual reports of the World Bank and United Nations Development Program (UNDP), various issues. Financial figures, monetary aggregates and the general price level were obtained from various reports produced by the

International Monetary Fund (IMF). International figures including world real income were proxied by real GDP, in billions of US dollars, for the ten major trading partners with Vietnam, and the world price level and world nominal interest rate were taken from International Financial Statistics (IFS). Each variable is defined and its source noted in Appendix 6.1. All the variables are in real terms and expressed in logarithms except for the domestic and international nominal interest rates, which are expressed as percentages. The model is estimated using yearly data from 1986 to 2001. This period saw the introduction of significant adjustment policies to change the Vietnamese economy from being centrally planned to a market oriented one. Although the data set is not large, containing only 16 observations corresponding to the duration of Vietnam's transition, it represents the best choice from available sources. As with many other transition economies, some data are simply not available. In several other cases some data may be available but are not appropriate to the definitions of the relevant simulation variables, thus proxies are needed.

The model developed in Chapter 5 contains 20 equations and 3 definition equations³⁰, which include a total of 42 parameters. For a number of the variables in the model no data exist. Hence either a proxy variable can be substituted, if it exists, or the parameter value must be imposed, based upon other studies and casual empiricism. All the parameters of the equations, which are elasticities since the model is expressed in logarithm form, are listed in Table 6.1. For the equations (1), (2), (9), (10), (14), (15), (16), and (19) the coefficients are estimated using Vietnamese data. The parameters of the remaining equations are imposed from existing sources³¹.

³⁰ The definition equations define the inflation expectation, the real exchange rate and real money balances, respectively.

³¹ These parameters are imposed based on the HL and HK models (see Chapter 5) and some existing studies on Vietnam. They will be identified in Chapter 7.

Table 6-1: Model Parameters

Equation	(1)	(2)	(3)	(4)	(5)
Parameters	$\alpha_1^*, \alpha_2^*, \alpha_3^*,$ α_4^*, α_5^*	c_1^*, c_2^*	β	τ_1, τ_2	η
Equation	(6)	(7)	(9)	(10)	(11a)
Parameters	φ	θ	$\varpi_1^*, \varpi_2^*,$ ω_3^*	$\mu_1^*, \mu_2^*,$ μ_3^*	ψ
Equation	(12)	(13)	(14)	(15)	(16)
Parameters	$\delta_1, \delta_2, \delta_3$	$\varepsilon_1, \varepsilon_2, \varepsilon_3,$ ε_4	$\sigma_1^*, \sigma_2^*,$ σ_3	$\tau_1^*, \tau_2^*,$ τ_3	ρ_1^*, ρ_2^*
Equation	(17)	(18)	(19)		
Parameters	α	ϕ_1, ϕ_2	$\lambda_1^*, \lambda_2^*, \lambda_3^*, \lambda_4^*$		

Note:

- Due to the limitation of the collected data, only parameters denoted with an * will be estimated in this chapter.
- See Chapter 5, p. 169 for more information on the meaning of each of these parameters.

The equations in the model are divided into three categories, “identity”, “adjustment”, and “behavioural” equations³².

Log-linear equations (3), (12), (13) and (17)³³ are classified as an “identity” or “proportional” equations, comprising 9 parameters, which use values from existing studies. Equation (8) identifies government consumption (c^g) as an exogenously determined variable. Equations (20), (21) and (22) are defined as those in the HL and HK models.

Equations (4), (5), (6), (7), (11a,b), (12), and (18) are the “adjustment” equations. Equations (4) and (5) identify the adjustment of the private capital stocks, (K^p), when the

³² “Identity” equations must hold by definition of the variables involved.

“Adjustment” equations must hold the variables that can be adjusted following the policy changes.

“Behavioural” equations consider the motives and structure of the variables involved (Oxford Economic Dictionary, 2000).

³³ Page 168 Chapter 5.

privatisation policy is applied. Equations (6) and (7) present adjustment of the state-owned enterprise, (K^s) , and public capital stocks, (K^g) , respectively, which capture the partial adjustment process. This partial adjustment arises from the political process of adjusting the actual state enterprise capital stock, (k^e) , and public capital stock, (k^g) , to their policy determined levels (k^{e*}) and (k^{g*}) respectively. Equation (11a) identifies money stock adjustment, (M) , with the adjustment coefficient ψ . Equation (12) identifies the adjustment of Tobin's q ratio (ϕ) . Finally, Equation (18) identifies wage adjustment (w) . All parameters in the eight adjustment equations will be imposed from the HL and HK models or assumptions based upon Vietnamese data.

The remaining eight structural equations (1), (2), (9), (10), (14), (15), (16), and (19) are behavioural equations, which all together comprise 25 parameters, where 23 parameter values will be estimated and 2 parameter values are assumed (see Table 6.1). A simple OLS estimation method will be utilised first for these behavioural equations. Then an analysis of the estimated results is required in order to determine the appropriate specification for estimation purposes. The details of the estimation and analyses will be presented in the following sections.

6.3 Regression Model Estimation and Evaluation Interpretation

The behavioural equations are estimated by drawing on time series data covering the period 1986-2001. A simple estimation method – OLS – is first applied. Each individual equation is evaluated using statistics such as t -values, Durbin-Watson (DW) test, R^2 (coefficient of determination), and F -values. Contained in Table 6.2 are the estimates of the eight behavioural equations of the model. The numbers in parentheses below each coefficient are the t -values. Intuitively, Figure 6.1, which plots the actual and fitted values for all the behavioural equations, can help to check the estimated regression results and determine whether the equations are acceptable.

Table 6-2: OLS Estimation Results of the Level of Logarithm Variables

Equation (1)	$y^d = 0.262 + 0.89 * c^p + 0.197 * i - 0.185 * c^s + 0.106 * i^s + 0.019 * (tx - tm)$ <p style="text-align: center;">(1.11) (10.89) (2.11) (-1.30) (2.14) (1.82)</p> $R^2 = 0.999 \quad DW = 1.598 \quad F(5,10) = 7820.2 [.000]$
Equation (2)	$c^p = 0.265 + 1.014 * y^s - 0.065 * w^p$ <p style="text-align: center;">(1.42) (13.68) (-1.0)</p> $R^2 = 0.999 \quad DW = 0.566 \quad F(2,13) = 6406.1 [.000]$
Equation (9)	$m - p = 5.727 - 1.159 * y^d - 0.224 * r + 1.21 * w^p$ <p style="text-align: center;">(7.74) (-5.30) (-3.44) (6.39)</p> $R^2 = 0.953 \quad DW = 1.397 \quad F(3,12) = 80.2 [.000]$
Equation (10)	$w^p = 0.057 + 0.115 * (f + e - p) + 0.792 * (m - p) + 0.619 * (k^p + q)$ <p style="text-align: center;">(0.26) (3.51) (11.19) (11.73)</p> $R^2 = 0.997 \quad DW = 1.426 \quad F(3,12) = 1857.5 [.000]$
Equation (14)	$tx = -20.147 + 2.013 * y^w + 0.143 * (e - p)$ <p style="text-align: center;">(-14.77) (19.54) (1.79)</p> $R^2 = 0.973 \quad DW = 1.077 \quad F(2,13) = 233.3 [.000]$
Equation (15)	$tm = 5.772 + 0.443 * y^d - 0.72 * (e - p)$ <p style="text-align: center;">(11.1) (7.9) (-4.02)</p> $R^2 = 0.831 \quad DW = 1.183 \quad F(2,13) = 30.3 [.000]$
Equation (16)	$(f + e - p) = -0.993 + 0.509 * (tx - tm) - 0.131 * (r^w f + e - p)$ <p style="text-align: center;">(-0.30) (1.28) (-0.95)</p> $R^2 = 0.163 \quad DW = 2.099 \quad F(2,12) = 1.7 [.22]$
Equation (19)	$y^s = 2.645 + 0.462 * k^p + 0.461 * k^e - 0.126 * k^s + 0.69 * (w - p)$ <p style="text-align: center;">(3.31) (4.58) (2.14) (-0.60) (1.45)</p> $R^2 = 0.997 \quad DW = 1.588 \quad F(4,11) = 1030.2 [.000]$

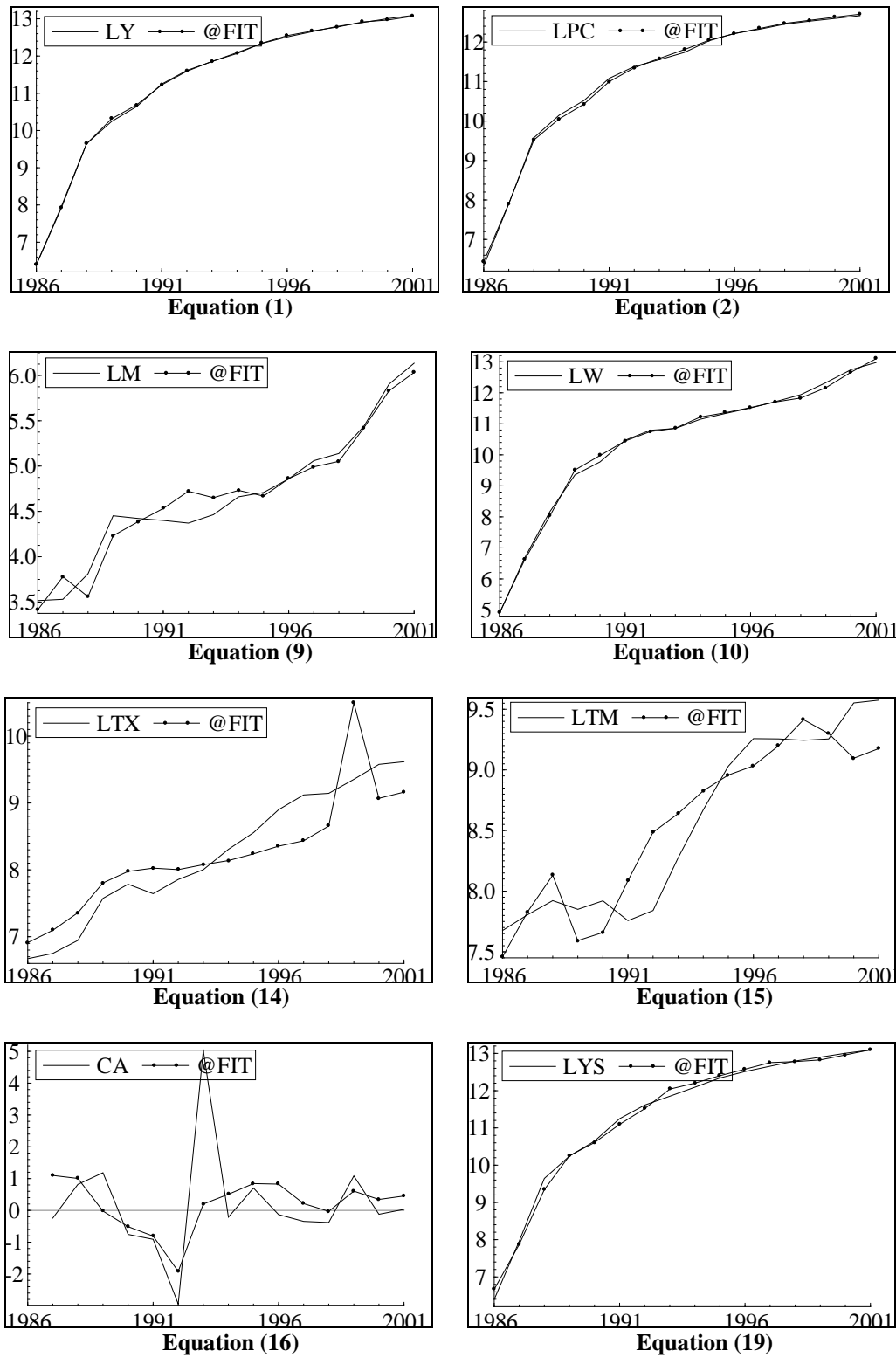
Note:

- Due to R^2 small, Equation (16) is re-calculated by using a dummy variable representing the change in year 1992 (number 0 for year 1992 and number 1 for the remainings). The result is as follows:

$$(\cancel{f} + \cancel{e} - \cancel{p}) = -3.83 + 0.66 * (tx - tm) - 0.07 * (r^w f + e - p) + 5.23 * D$$

(-2.38) (4.27) (-0.74) (7.33)

$$R^2 = 0.87 \quad DW = 1.76 \quad F(3,11) = 23.95 [.000]$$

Figure 6-1: Behavioural Equations: Actual and Fitted Variables

Equation (1) of Table 6.2 shows the results for aggregate output demand, (y^d) , which depends on private (c^p) and government (c^g) consumption, total productive capital investment, (i) , public capital investment, (i^g) , and the trade balance, $(tx - tm)$. Explanatory variables are statistically significant at the 5 and 10 per cent level and have the theoretically expected sign except for government consumption, which has a theoretically unexpected sign, possibly due to multicollinearity. Private consumption exerts a remarkable influence on aggregate demand with its elasticity recording 0.89 per cent. The trade balance has a small impact on aggregate output demand, although its t -statistic is quite high (1.8), probably indicating the unreliability of the data collected³⁴. The R^2 (0.99) and DW statistic (1.6) are good. In Figure 6.1 (Equation 1) it can be seen that the actual values fluctuate very closely to the fitted ones.

Equation (2) provides estimates of the determination of private consumption expenditure, (c^p) . Aggregate output supply, (y^d) , which is statistically significant at the 99 per cent confidence level, exerts a remarkable influence on private consumption, with its elasticity recording 1.014. A 1 per cent increase in domestic aggregate output supply increases private consumption by more than 1 per cent. Private wealth, (w^p) , which is given by the sum of foreign asset stocks, broad money and private capital stocks, has a theoretically unexpected negative sign. This can be explained by the fact that aggregate output supply in a given period is not enough for private consumption, thus private wealth is the source to supplement this shortage. Although yielding a high $R^2 = 0.999$ the regression result for the private consumption equation seems to have a negative autocorrelation, as the DW is very small (0.57). The low DW statistic confirms the existence of autocorrelation resulting from model misspecification. However, a look at the actual and fitted values plotted in Figure 6.1 for Equation (2) suggests that it may not be so. From the figure it is noted that the actual and fitted values are very close together indicating that the equation is a true regression. Due to the low DW statistic the re-estimation of this

³⁴ A percentage of illegal trade and smuggling across the borders with China, Laos and Cambodia is reported at about 15-20 per cent of the official statistics of the trade balance.

equation using iterative procedures proposed by Cochrane and Orcutt³⁵ (see Appendix 6.2 for more details) is conducted. Although the regression result (after being converted to the original equation) has the same values of the coefficients and the private wealth variable still has a wrong sign, the DW statistic is much higher (2.0) compared to its value in the ordinary least squares approach (see Table 6.3 further below).

Equation (9) shows the results of the demand for real money balances, which is defined as the nominal money stock deflated by the consumer price index ($m - p$). The domestic interest rate, (r), and private wealth, (w^p), variables are statistically significant at the 5 per cent level, and have the theoretically expected signs with their coefficients reporting 0.22 and 1.2 respectively. Domestic aggregate demand, (y^d), has a significant (at the 5 per cent level) and unexpected negative coefficient. The R^2 is good but the DW statistic is smaller than 2, reporting 1.4. A closer examination of Figure 6.1 (Equation 9) shows that the year-on-year changes in the demand for real money balances do not in fact match particularly well with the changes in the independent variables, including domestic aggregate demand and domestic nominal interest rates. The iterative Cochrane-Orcutt procedure is used to re-estimate this equation. From Table 6.3 it can be seen that the values of the estimated parameters are higher than those of the OLS estimation, while their signs are unchanged.

With respect to real private wealth, (w^p), (Equation 10), all explanatory variables including the demand for real money balances, ($m - p$), and the real value of the domestic capital stock, ($k^p + q$), owned entirely by agents in the domestic private sector, which consists of a physical quantity and its market valuation³⁶, and domestic holdings of foreign bonds, expressed in domestic currency terms and deflated by the domestic price level, ($f + e - p$), have a strong positive impact on real private wealth with their coefficients being significant at the 5 per cent level and their values being 0.79, 0.62 and 0.12 respectively. The result from this regression is good as it yields a high R^2 , but there is

³⁵ Damodar N. Gujarati (1995) “Basic Econometrics” (p. 431).

³⁶ The data for such a market valuation, required to calculate Tobin's q , is not available in Vietnam.

probably negative autocorrelation when considering the value of the DW statistic (1.4). However, a closer examination of Figure 6.1 for Equation (10) shows that the year-to-year changes in all explanatory variables in fact match particularly well with the changes in real private sector wealth.

Total exports, (tx) , are reported in Equation (14) and they respond to increases in foreign real income, (y^w) , proxied by the sum of the GDP of Vietnam's ten main trading partners, and the real exchange rate, $(e - p)$. The coefficient for foreign real income is highly significant (19.5) suggesting that Vietnam's exports largely depend on the real incomes of its trading partners. This can explain why Vietnam has witnessed a sharp falling off in exports as its key East Asian trading and investment partners entered a recession during the period 1997-2000. With a coefficient of 0.14 the significance of the real exchange rate is also apparent, indicating that Vietnam's exports have also been affected by the foreign exchange rate policy. Although the result yields a high R^2 (0.97), a low DW statistic (1.08) is usually considered as proof of autocorrelation between the explanatory variables. Figure 6.1 (Equation 14) may confirm this result as the actual values swing far from the fitted ones. The coefficients of the explanatory variables are not different when the Cochrane-Orcutt method is applied to re-estimate this equation. However, its statistics are much improved.

Equation (15) provides estimates for aggregate imports, (tm) , which depend on domestic aggregate demand, (y^d) , and the real exchange rate, $(e - p)$. Both these variables are statistically significant at the 5 per cent level and, with their theoretically expected signs, have a strong impact on aggregate imports. With the value of the coefficient of determination being 0.83 and the DW statistic recording 1.2, this result probably shows autocorrelation. This is also supported by Figure 6.1 (Equation 15), although both actual and fitted values "trend" upwards, where the year-on-year changes in aggregate demand and the real exchange rate do not match particularly well with the changes in total imports. In this case using the Cochrane-Orcutt procedure may improve the estimated results. The coefficient of domestic aggregate demand is much higher than the previous result, whilst

the real exchange rate has a theoretically unexpected sign. All the explanatory variables are statistically significant at the 10 per cent level (see Table 6.3).

Equation (16) indicates the accumulation/decumulation of foreign bonds, as reflected in the current account balance, $(\dot{f} + \dot{e} - p)$, which depends on the trade balance, $(tx - tm)$, and real foreign interest earnings, $(r^* f + e - p)$. The first explanatory variable has the theoretically expected sign and is statically significant even at the 10 per cent level, whilst real foreign interest earnings has an unexpectedly negative coefficient and is insignificant at the 10 per cent level. The R^2 is only 16 per cent³⁷, indicating that only 16 percent of the total variation in the current account balance can be explained by variations in the trade balance and real foreign interest earnings. However, the Durbin-Watson statistic is 2.1, indicating no autocorrelation. This is also confirmed by Figure 6.1 (Equation 16) where the movement of the actual values is far from the fitted ones. The spike in the actual current account balance in the year 1993 is due to the large trade deficit.

For aggregate output supply, (y^s) , Equation (19), the capital stock of state-owned enterprises, (k^e) , and the private sector, (k^p) , has a strong positive impact on state output supply with both coefficients recording the same value of 0.46. This is not puzzling, as the increased capital stock from investment tends to raise the productive capacity of both state and private sectors. Public capital expenditure, (k^s) , which is often regarded as productive expenditure, and the real wage rate, $(w - p)$, have the wrong sign in the estimated results. For this equation there is no suspicions about the spuriousness of the results as far as the diagnostic statistics and figure of the actual and fitted values are concerned.

Overall, the quantitative estimates are satisfactory in spite of some parameters of the model having the theoretically unexpected signs or that several explanatory variables are statistically insignificant at the 10 per cent level. Given the relatively high value of the R^2 , except Equation 16 (due to the outlier), it can be said that the endogenous variables have predicted reasonably well. However, the value of the Durbin-Watson statistics may be of

³⁷ R^2 increases to 0.87 when this equation is re-calculated by adding a dummy variable (see Note of Table 6.2).

concern regarding serial correlation in the residuals of these equations. The iterative Cochrane-Orcutt procedures are used to re-estimate these equations. The intuitive approach by plotting the actual and fitted values of the regressions also confirms the estimated results.

Table 6-3: Iterative Cochrane-Orcutt estimation results

Equation (1)	$y^d = -0.38 + 0.98 * c^p + 0.1 * i - 0.1 * c^g + 0.04 * i^g + 0.003 * (tx - tm)$ <p style="text-align: center;">(-1.03) (12.28) (0.98) (-0.4) (1.0) (0.32)</p> $R^2 = 0.999 \quad DW = 2.18$
Equation (2)	$c^p = 0.65 + 0.97 * y^s - 0.1 * w^p$ <p style="text-align: center;">(3.02) (23.1) (-1.66)</p> $R^2 = 0.999 \quad DW = 2.08$
Equation (9)	$m - p = 9.27 - 1.52 * y^d - 0.46 * r + 1.33 * w^p$ <p style="text-align: center;">(4.65) (-5.83) (-3.6) (7.5)</p> $R^2 = 0.95 \quad DW = 1.88$
Equation (10)	$w^p = -0.7 + 0.33 * (f + e - p) + 0.45 * (m - p) + 0.6 * (k^p + q)$ <p style="text-align: center;">(-0.72) (2.62) (1.9) (3.23)</p> $R^2 = 0.995 \quad DW = 2.07$
Equation (14)	$tx = -15.2 + 1.97 * y^w + 0.23 * (e - p)$ <p style="text-align: center;">(-4.63) (7.94) (0.92)</p> $R^2 = 0.95 \quad DW = 1.93$
Equation (15)	$tm = 0.52 + 0.65 * y^d + 0.14 * (e - p)$ <p style="text-align: center;">(0.13) (2.15) (0.53)</p> $R^2 = 0.93 \quad DW = 2.13$
Equation (16)	$(f + e - p) = -0.94 + 0.73 * (tx - tm) - 0.3 * (r^w f + e - p) + 4.72 * D$ <p style="text-align: center;">(-0.37) (4.0) (-1.40) (5.64)</p> $R^2 = 0.91 \quad DW = 1.55$
Equation (19)	$y^s = 3.5 + 0.3 * k^p + 0.54 * k^e - 0.1 * k^g + 0.32 * (w - p)$ <p style="text-align: center;">(3.32) (2.0) (3.0) (-0.3) (0.6)</p> $R^2 = 0.99 \quad DW = 1.3$

The estimation of the model using the regression approach presented above was based on the economic time series which are clearly non-stationary (see Figure 6.1), in the

sense that the mean and variance depend on time, and they tend to depart ever further from any given value as time goes on. It is argued that the regression of one non-stationary variable on another is very likely to yield regression results that are spurious. Thus the alternative modelling testing approaches dealing with non-stationary time series data, which will be investigated with the purpose of estimating the parameters of the model, will be presented in the next sections.

6.4 Long-term and short-term relationships between macroeconomic variables

The first concept of causality was proposed by Granger (1969) to investigate possible causation between economic variables. The concept is based on the cross-spectrum decomposition and deals specifically with short-run fluctuations (Harvie and Tran Van Hoa, 1993). Empirical applications of this Granger causality test have been extensive in the literature and involve many important areas of economics, such as money and income (Sims, 1972), and wage and price inflation (Fels and Tran Van Hoa, 1981). The theory of cointegration (Granger, 1981, 1986; Engle and Granger, 1987) also deals with causation between economic variables, but is focused particularly on long-term relationships. The basic idea of the theory is that causal or correlated economic series may wander in the short-run, but they will not drift apart in the long run or in equilibrium. Thus, in the short run, the equilibrium error may not be zero, but in the long run systematic differences between the causal or cointegrated variables should disappear.

The empirical tests of the above methods assume that the variables in the models must be stationary for causality and non-stationary for cointegration. In addition, in applied economic work, it is well known that the reliability of the results of both the causality and cointegration methods depends not only on the correct information set used but also crucially on the usually unknown lag structure of these variables. There are several appropriate tests of cointegration including cointegration regression analysis (Sargan and Bhargava, 1983), which will be used in this section, Dickey-Fuller and augmented Dickey-

Fuller regression procedures, and restricted and unrestricted vector autoregression methods (Engle and Granger, 1987). More recent developments of the cointegration theory include the maximum likelihood approach of Johansen (see for example Johansen, 1991) within the unified framework of vector autoregressive and error correction models, in which cointegrating vectors are simply obtained as eigenvectors. It can be verified that the eigenvector approach yields identical results to the OLS approach, in the case where the eigenvector is derived from the maximum characteristic root and when the data set is very large.

This section will first test for unit roots in the time series variables of interest (6.4.1) and then for cointegration between the series (6.4.2).

6.4.1 Unit roots test

Since both causality and cointegration test procedures are based on regression analysis, it is necessary for estimation to ensure that the series satisfy the required stationarity conditions. In this study, the test of unit roots³⁸ for a variable, say Y , consists simply of estimating the unrestricted regression equation (also known as the reduced form error correction model)

$$\Delta Y_t = \mu + \alpha t + \rho Y_{t-1} + \sum_{j=1}^p \theta \Delta Y_{t-j} + \varepsilon_t \quad (6.1)$$

and the restricted regression equation with unit root (with $\alpha = 0$ and $\rho = 0$)

$$\Delta Y_t = \mu + \sum_{j=1}^p \theta \Delta Y_{t-j} + \varepsilon_t \quad (6.2)$$

In (6.1) and (6.2), t is a time trend, ΔY_{t-j} an error correction term to capture higher order lag corrections, μ , α , ρ , θ are the parameters to be estimated, and ε the error terms with white noise properties.

³⁸ See Appendix 6.3 for more detail about the Dickey-Fuller test for unit roots.

For the augmented Dickey-Fuller (ADF) test the presence of drift or trend necessitates that if the null hypothesis of a unit root ($H_0 : \rho = 0$) is not rejected (using Fuller's (1976) $\hat{\tau}_\tau$ distribution of the t -statistic of $\hat{\rho}$), then it is necessary to proceed to test the joint hypothesis that $\rho = 0$ and $\alpha = 0$ (using the F -statistic Φ_3 given in Dickey and Fuller, 1981). If the trend is significant under the null of a unit root, then normality of the t -statistic of $\hat{\rho}$ follows, and the standardised normal tables should be used (Dolado, et. al., 1990). If the trend is not significant, the null hypothesis is then tested with the constraint that $\alpha = 0$ (using $\hat{\tau}_\mu$ from Fuller, 1976). Again, failure to reject means testing the joint hypothesis that $\rho = 0$ and $\mu = 0$ (this time using the F -statistic Φ_1 given in Dickey and Fuller, 1981). If the constant under the null hypothesis is significant, then the test for the unit root should be repeated using the standardised normal; otherwise, Fuller's $\hat{\tau}$ should be used. The results of unit root tests, which are conducted in this section, are based on both the t -statistic of $\hat{\rho}$ (τ_τ distribution) and F -statistic (Φ_3).

An informal examination of the data for nineteen variables may be useful to give a preliminary idea of the time series properties of the variables. Figure 6.2 plots the logarithms of levels of all the variables and confirms that non-stationarity is apparent in all the series.

The starting point is to test for integration properties of the individual series using ADF tests mentioned before, with and without trend. These tests allow testing formally the null hypothesis that a series is $I(1)$ against the alternative that it is $I(0)$. In order to determine the order of integration, the tests must be applied to the levels of the variables and then to the first or second differences of the variables. If the computed absolute value of the t -statistic ($\hat{\tau}_\tau$) for the case of without trend or that of the F -statistic (Φ_3) for the case of with trend exceeds the tabulated absolute values by Fuller (1976) or Dickey and Fuller (1981) respectively, then the hypothesis that the given time series is stationary cannot be rejected.

The results of unit root tests using the annual time-series data from 1986-2001 for all the variables are given in Table 6.4. For fifteen variables, namely private real consumption

(c^p), government consumption (c^g), private wealth (w^p), real money balances ($m - p$), domestic price level (p), domestic nominal interest rate (r), foreign asset stock ($f + e - p$), total exports (tx), total imports (tm), real foreign interest earnings ($r^* f + e - p$), world real income (y^*), and current account balance (f), nominal exchange rate (e), private capital stock (k^p), and domestic real wage ($w - p$), the null hypothesis of a unit root based on the estimated $\hat{\tau}_\tau$ value cannot be rejected. So the results are compatible with the hypothesis that non-stationarity characterises these variables. For the remaining variables, aggregate supply of output (y^s), real exchange rate ($e - p$), SOE investment capital stock (k^e), and government investment expenditure (k^g), their estimated $\hat{\tau}_\tau$ values are well above the critical values tabulated by Fuller (1976) at 10 per cent and supports the hypothesis that stationarity characterises these variables. However, the results from using the ADF tests suggest that five variables, private wealth (w^p), foreign asset stock ($f + e - p$), real exchange rate ($e - p$), SOE investment capital stock (k^e), and government investment expenditure (k^g), are stationary with trend (Equation 6.1) based on F - statistic (Φ_3) tabulated by Dickey and Fuller (1981).

The application of the ADF test then is conducted to the first and second differences of the variables in order to determine the order of integration. However, the conclusion (the results are not shown here) of the order of the variables, $I(1)$ or $I(2)$ are inconclusive because the critical values for unit root tests tabulated by Fuller (1976) or Dickey and Fuller (1981) have a sample size of at least 50, whilst the sample size of data used here has only 16 observations³⁹. The critical values for smaller sample sizes are not presently available⁴⁰.

From Figures 6.3 and 6.4, which plot the first and second differences of the logarithms of the variables, respectively, it might be concluded that the variables under consideration are well characterised as non-stationary in the levels and first difference, but

³⁹ The sample size is only 12 when second-differenced variables are tested.

⁴⁰ When only a small sample size is available there is a concern with the *a priori* power and size of the tests of the unit root. This problem will be examined in Section 6.6.

stationary in the second difference, which mean that the variables are integrated of order $I(2)$. For the cases that have limited time series data observations and experience a structural break, however, the results from the formal test, as well as graphic examination of the data mentioned above, may be inconclusive. The next step is to test whether the time series in question are cointegrated.

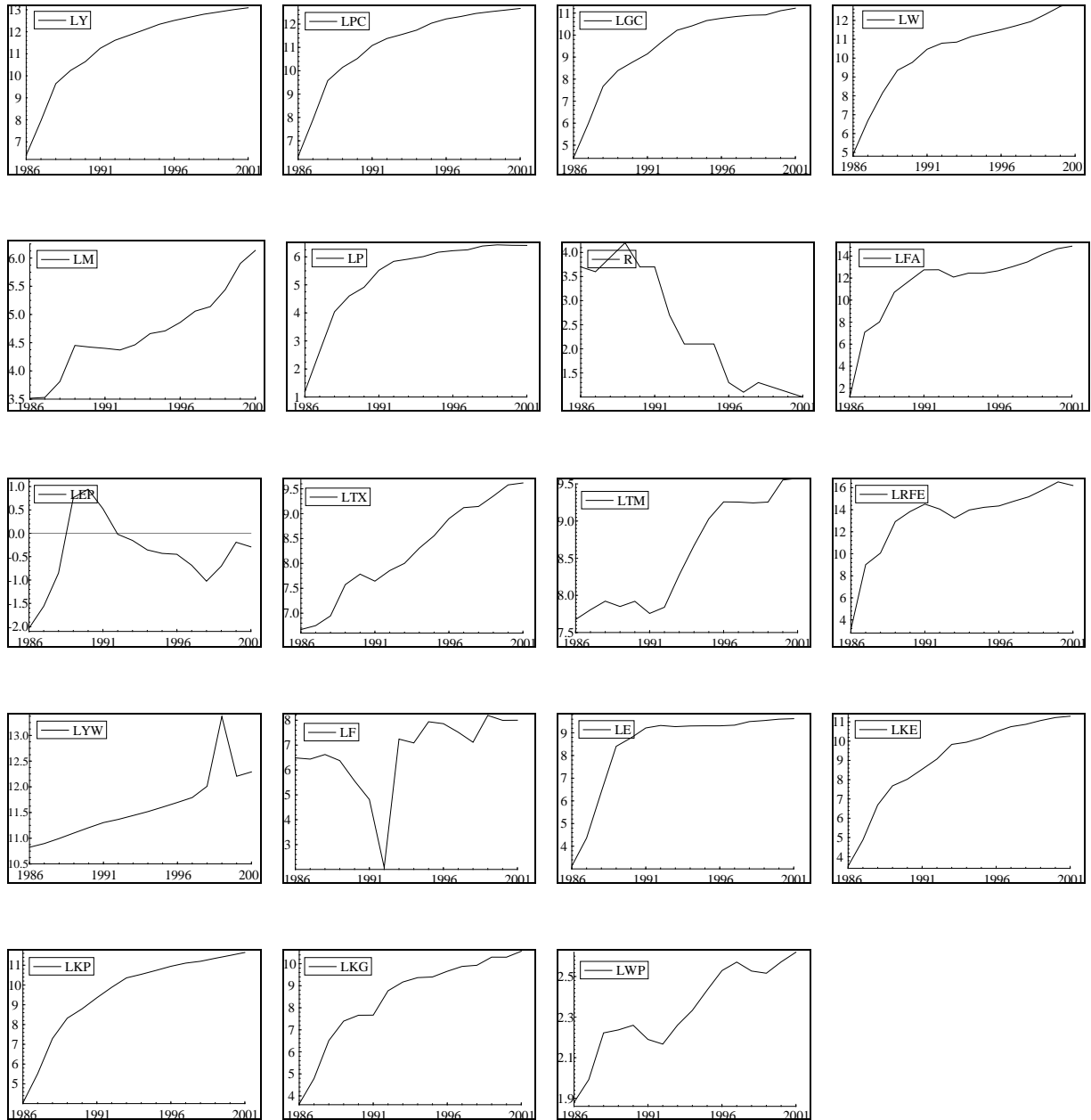
Figure 6-2: Plot of (log) Levels of the Variables

Table 6-4: Tests for Unit Roots of Variables: Vietnam 1986 to 2001

	Variables	ADF tests for a unit root		
		t-ratio (τ -test)	F-test (Φ_3)	lag length p ¹
1	Aggregate output supply (y^s)	-3.31*	4.43	4
2	Private real consumption (c^p)	-1.77	1.35	3
3	Government consumption (c^g)	-2.33	2.18	4
4	Private real wealth (w^p)	-0.34	5.87*	2
5	Real money supply ($m - p$)	-0.27	2.69	1
6	Domestic price level (p)	-2.06	2.34	3
7	Domestic nominal interest rate (r)	-0.58	3.26	1
8	Foreign asset stock ($f + e - p$)	-0.75	5.67*	3
9	Real exchange rate ($e - p$)	-3.85*	8.55*	3
10	Total exports (tx)	-0.27	4.26	3
11	Total imports (tm)	-0.64	3.64	1
12	Real foreign interest earnings ($r^* f + e - p$)	-1.04	4.38	3
13	World real income (y^*)	0.53	1.17	1
14	Current account balance (f)	-1.40	3.09	2
15	Nominal exchange rate (e)	-0.95	2.18	4
16	SOE capital stock (k^e)	3.89*	12.40*	4
17	Private sector capital stock (k^p)	-1.72	1.64	2
18	Government investment expenditure (k^g)	-4.58*	11.57*	3
19	Domestic real wage ($w - p$)	-0.20	3.29	4

Note:

- All variables in the Table are in logs except r and r^w .
- Critical values are given in Fuller (1976) and Dickey and Fuller (1981). At the 10% level they are -2.57 [for $\hat{\tau}_\tau$] and -5.34 [for Φ_3] for $n = 50$.
- ¹ The choice of the length of the distributed lag of (first-differenced) variables under consideration was decided upon by experimenting with the lag-length p that minimised the value of the Akaike (1974) information criterion to determine the optimal specification of equations (6.1) and (6.2).
- * Since the computed absolute values of these variables are greater than the 10% critical values, the null hypothesis can be rejected, so these variables do not exhibit the unit roots.

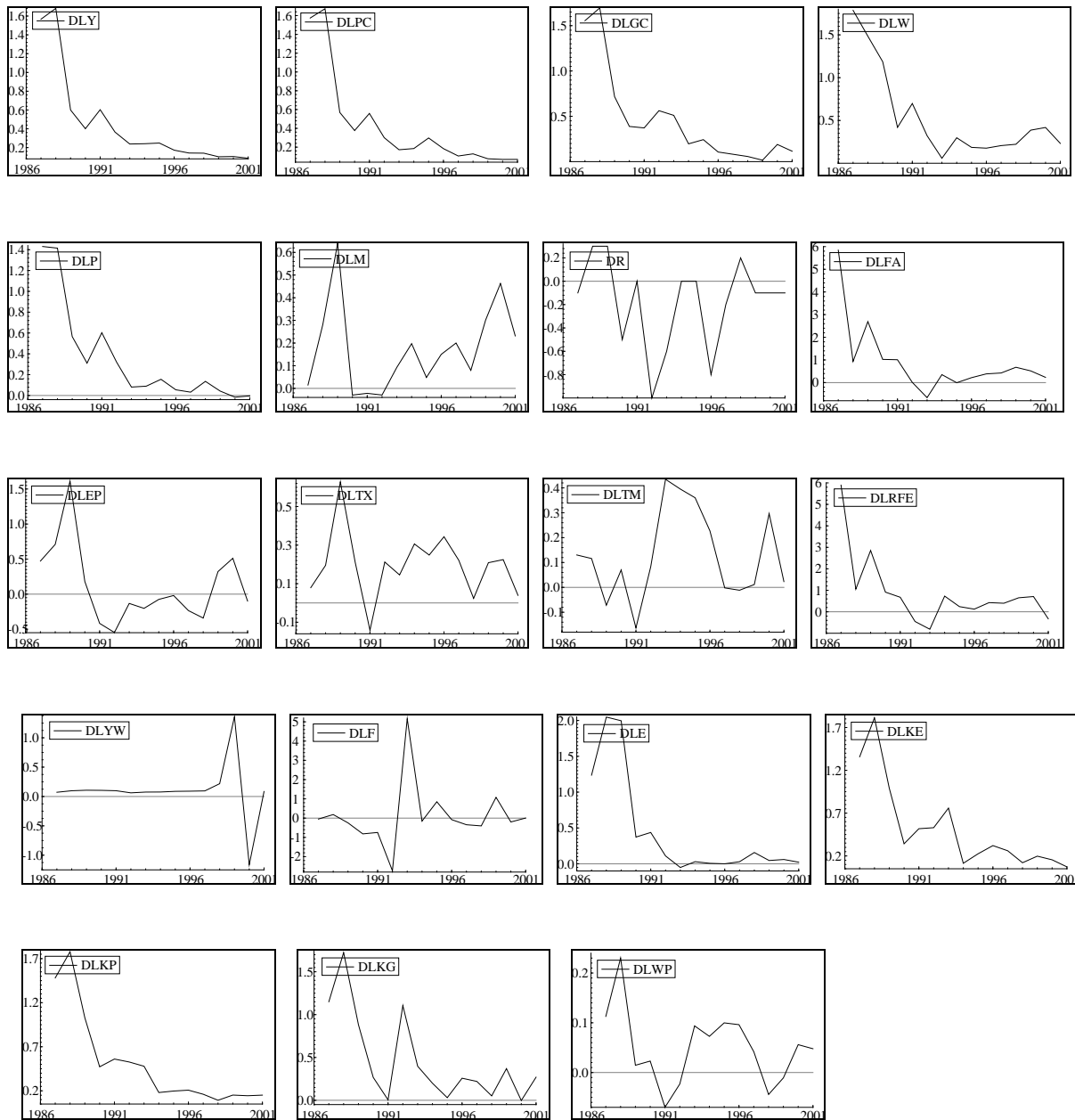
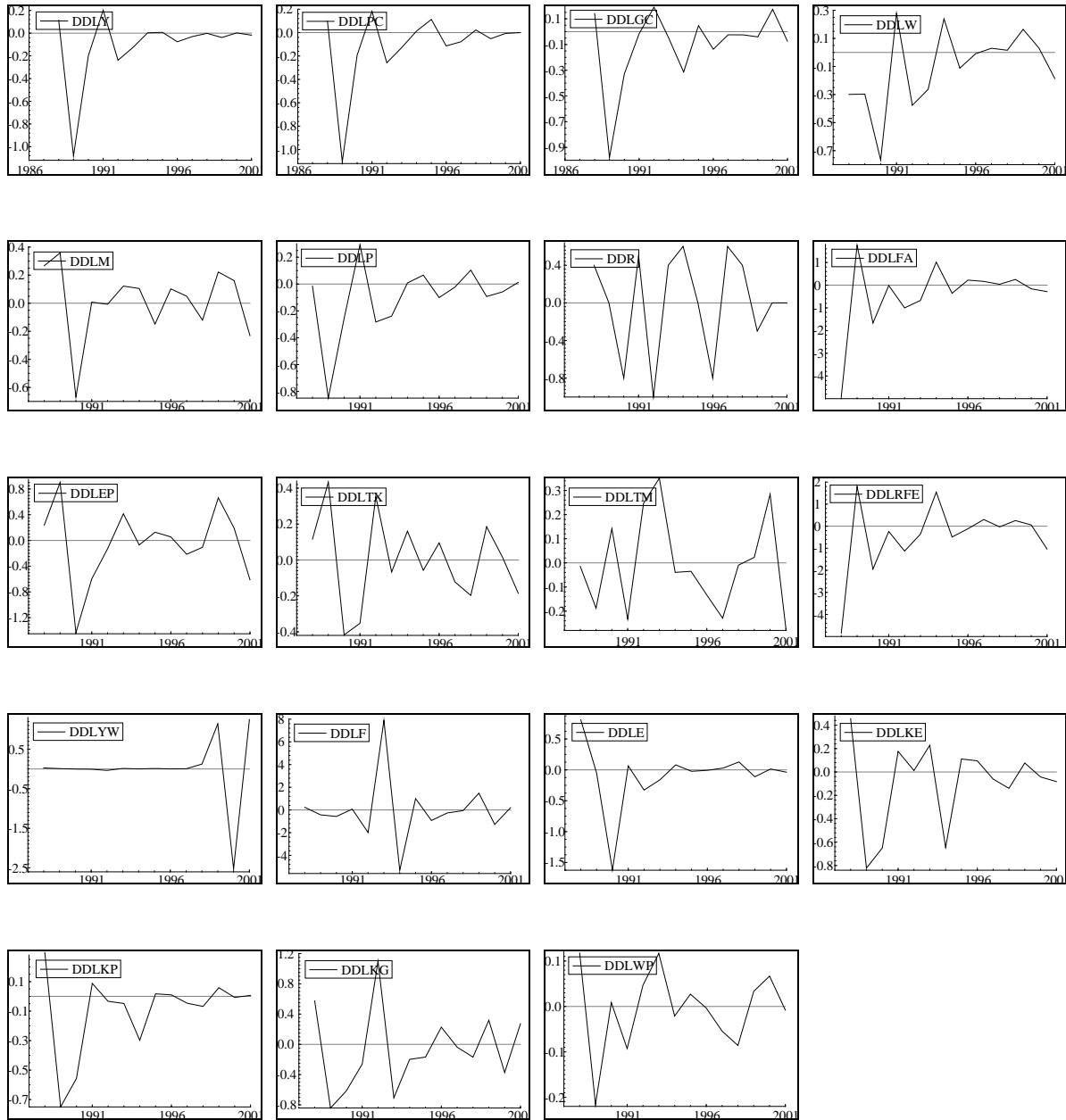
Figure 6-3: Plot of First Differences of the (log) Variables

Figure 6-4: Plot of Second Differences of the (log) Variables

6.4.2 Cointegration between macroeconomic variables

The results from the tests for unit roots previously indicate that most variables concerned are non-stationary. Regression involving non-stationary data may include the possibility of obtaining spurious results. To see this problem, look back to the OLS estimation results reported in Table 6.2. The regression results of estimated equations look good in terms of high R^2 and statistically significant t statistics. The only worry is that the DW statistics are low probably due to some multicollinearity. However, if variables are found to be cointegrated then there is a long run relationship between two (or more) non-stationary variables. In this case, although those variables themselves are non-stationary, a linear combination of them might be stationary. If that is the case the regression on the levels of the variables would be meaningful (not spurious) (Gujarati, 2003).

For example, if two variables y_t and x_t are non-stationary or random walk stochastic processes (each is $I(1)$), then the linear combination of these two variables $u_t = y_t - \beta_1 - \beta_2 x_t$ might be stationary, or $I(0)$. In this case these two variables are said to be cointegrated or they are on the same wavelength. Intuitively, when u_t is stationary or $I(0)$, the “trend” in y_t and x_t cancel out (Griffiths, Hill and Judge, 1993).

The formal definition of cointegration of two variables first developed by Engle and Granger (1987) is as follows.

Definition: Time series x_t and y_t are said to be cointegrated of order d , b where $d \geq b \geq 0$, written as: $x_t, y_t \sim CI(d, b)$, if:

1. both series are integrated of order d ,
2. there exists a linear combination of these variables, say $\alpha_1 x_t + \alpha_2 y_t$, which is integrated of order $d - b$.

The vector $[\alpha_1, \alpha_2]$ is called a cointegrating vector.

There are a number of methods for testing cointegration. Two simple methods are (i) the DF or ADF test on u_t estimated from the cointegrating regression called Engle-Granger (EG) or Augmented Engle-Granger (AEG) test; and (ii) the cointegrating regression Durbin

Watson (CRWD) test provided by Sargan and Bhargava (1983). For the EG or AEG test, all we have to do is estimate a regression (like Table 6.2), obtain the residuals, and then use the DF or ADF test for their stationarity⁴¹. If y_t and x_t are not cointegrated, any linear combination of them will be non-stationary and, therefore, the residuals u_t will be non-stationary too. The Engle-Granger 1, 5, and 10 per cent critical values of the t value in the residual regression are, respectively, -2.5899, -1.934, -1.6177. If in absolute terms the estimated t value exceeds these critical values, the conclusion would be that the estimated u_t is stationary, and, therefore, y_t and x_t , despite being individually non-stationary are cointegrated.

An alternative, and quicker, method of finding out whether y_t and x_t are cointegrated is the CRWD test. With the CRWD the DW statistic value obtained from the cointegrating regression is used. But now the null hypothesis is that $DW = 0$ rather than the standard $DW = 2$. The 1, 5, and 10 per cent critical values to test the hypothesis that the true $DW = 0$ are 0.511, 0.386, and 0.322, respectively. Thus, if the computed DW value is smaller than, say, 0.511, the hypothesis of cointegration at the 1 per cent level is rejected, which means that y_t and x_t are not cointegrated.

Based on both the EG and CRDW tests, cointegration among the variables of the eight behavioural equations estimated by using OLS in the previous section will be tested. The results from the DF unit root test indicated that 15 out of the 19 variables are non-stationary in levels, but they are inconclusive in the context of formal or informal tests. It can be assumed here that these variables are integrated in the same order of $I(1)$. These variables are said to be cointegrated if the estimated t values of the residual regressions exceed the critical values tabulated by Engle and Granger (1987) for the EG cointegration test, or if the computed DW values exceed the critical levels for the CRWD test. Table 6.5 presents parameter estimates of the OLS using these two tests.

⁴¹ Since the estimated u_t is based on the estimated cointegrating parameter β_2 , the DF and ADF critical significance values are not quite appropriate. Engle and Granger have calculated these values.

Regressions of the eight behavioural equations (1), (2), (9), (10), (14), (15), (16) and (19) using the OLS method are first applied⁴², and then the residuals estimated from these regressions are subjected to the DF unit root test. Since, in absolute terms, the estimated t values for the residuals of equations (2), (9), (10), (15), (16) and (19) exceed the critical value at the 1 per cent significant level and those of equations (1) and (14) exceed the critical value at the 5 per cent significant level, the conclusion would be that the estimated u_t are stationary. This means they do not have a unit root. As seen also from Table 6.5 the calculated DW values are greater than the critical values for testing DW=0 in the case of 3-variable and 2-variable models, which are 0.363 and 0.327 respectively at the 5 per cent significance level. To sum up, based on both the EG and CRDW tests, the conclusion is that the variables under study form valid cointegrating relationships. Although they individually exhibit random walks, there seems to be a stable long-run relationship between these variables. They will not wander away from each other, as is evident from Figure 6.2.

⁴² These results are taken from the previous section.

Table 6-5: Cointegration Tests between Variables: 1986-2001

	Const.	c^p	i	c^s	i^s	t	y^s	y^d	w^p	r	$f - e + p$	$m - p$	$k^p + q$	t -values of ρ^1	DW
Aggregate demand	0.26 (1.1)	0.9 (10.9)	0.2 (2.1)	-0.19 (-1.3)	0.11 (2.14)	0.02 (1.8)								2.258*	1.6*
Private consumption	0.27 (1.4)						1.01 (13.7)		-0.07 (-1.0)					2.794**	0.57*
Real money demand	5.7 (7.7)							-1.16 (-5.3)	1.2 (6.4)	0.22 (3.4)				2.712**	1.4*
Domestic private wealth	0.06 (0.26)										0.12 (3.5)	0.8 (11.2)	0.62 (11.7)	3.124**	1.43*
	Const.	y^d	y^w	$e - p$	$tx - tm$	$r^w f + e - p$	k^p	k^e	k^s	$w - p$	t -values of ρ^1	DW			
Total exports	-15.5 (-13.7)		2.02 (19.5)	0.14 (1.8)							2.023*	1.08*			
Total imports	5.8 (10.85)	0.44 (7.7)		-0.71 (-3.85)							4.842**	1.17*			
Current account balance	-2.4 (-0.65)				0.64 (1.8)	-0.13 (-0.64)					3.656**	2.5*			
Aggregate supply	2.6 (3.3)						0.46 (4.58)	0.46 (2.14)	-0.12 (-0.60)	0.69 (1.45)	3.029**	1.59*			

Note:

- All variables except domestic and international nominal interest rates.
- ¹ t - values of ρ in equation $\Delta \hat{u}_t = \rho u_{t-1}$
- The critical value of residuals tabulated by Engle and Granger is 2.5899 at 1 per cent and 1.9439 at 5 per cent significant level.
- The critical value for testing DW=0 in the case of 3-variable models is 0.367 at the 5 per cent significant level. In the case of 2-variable models, it is 0.386.
- ** means the estimated t -values or DW are significant at the 1 per cent level; * means the estimated t -values or DW are significant at the 5 per cent level.
- t -values are in brackets.

6.4.3 The error correction model (ECM)

The results from the cointegration tests indicate that the variables in the eight behavioural equations are cointegrated, which implies that there is a long-term equilibrium relationship between them. Of course, in the short run, there may be disequilibrium. Therefore, one can treat the error term u_t ⁴³ as the “equilibrium error”. This error term can be used to link the short-run behaviour of the dependent variables to their long-run values. The error correction mechanism (ECM) first used by Sargan, and later popularised by Engle and Granger, corrects for disequilibrium (Gujarati, 1995). This is known as the *Granger representation theorem*, which in this case says that x_t and y_t are considered to be generated by ECMs of the form:

$$\Delta x_t = \rho_1 u_{t-1} + \text{lagged}(\Delta x_t, \Delta y_t) + \varepsilon_{1t} \quad (6.3)$$

$$\Delta y_t = \rho_2 u_{t-1} + \text{lagged}(\Delta x_t, \Delta y_t) + \varepsilon_{2t} \quad (6.4)$$

where at least one of ρ_1 and ρ_2 is non-zero and ε_{1t} and ε_{2t} are white-noise errors. Notice that ρ_1 and ρ_2 are the speed of adjustment parameters. The larger ρ_1 is, the greater the response of x_t to the previous period’s deviation from long term equilibrium. On the other hand, a very small value of ρ_1 and ρ_2 implies that x_t does not respond to last period’s equilibrium error. In the case that both ρ_1 and ρ_2 are zero there is no error correction, and Equation (6.3) and (6.4) comprise nothing more than Vector Autoregressions in first difference.

Table 6.6 presents the OLS estimations of the error-correction model (ECM) for the behavioural equations based on cointegrating VAR (1)⁴⁴ and VAR (2).

⁴³ $u_t = y_t - \beta_1 - \beta_2 x_t$

⁴⁴ If the order of the VAR (optimal lag length) for each equation is equal to one, the lagged changes of each independent variable in this equation cannot be calculated. Hence the only coefficient that appears in the ECM model is the coefficient of the error-correction term.

**Table 6-6: ECM Results Estimated by OLS Based on Cointegrating
VAR (1) and VAR(2)**

Equation (1) $y^d = \alpha_1 c^p + \alpha_2 i + \alpha_3 c^s + \alpha_4 i^s + \alpha_5 (tx - tm)$			
	Variable	Coefficient	t -ratio
VAR (1)	$ecml(-1)$	2.56	5.07**
Equation (2) $c^p = c_1 y^s + c_2 w^p$			
VAR (1)	$ecml(-1)$	-1.26	-11.85**
VAR (2)	$dy^s 1$	-2.39	-2.50*
	$dw^h 1$	-0.12	-0.80
	$ecml(-1)$	-3.32	-7.88**
	Adjust R^2		0.94
	F-statistic, (4,9)		53.32
	Serial correlation, LM(1)		0.83
	Functional form		5.41
	Heteroscedasticity		0.01
Equation (9) $m = p + \omega_1 y^d - \omega_2 r + \omega_3 w^p$			
VAR (1)	$ecml(-1)$	-0.002	-0.30
VAR (2)	$dy^d 1$	0.70	2.01*
	$dr1$	0.13	0.67
	$dw^p 1$	-0.73	-1.61*
	$ecml(-1)$	-0.03	-0.64
	Adjust R^2		0.04
	F-statistic, (4,8)		1.12
	Serial correlation, LM(1)		3.38
	Functional form		7.00
	Heteroscedasticity		0.39
Equation (10) $w^p = \mu_1 (f + e - p) + \mu_2 (m - p) + \mu_3 (k^p + q)$			
VAR (1)	$ecml(-1)$	-0.16	-11.49**
VAR (2)	$d(f + e - p)1$	-0.30	-3.02*
	$d(m - p)1$	-1.03	-3.61**
	$d(k^p + q)1$	-1.39	-3.04*
	$ecml(-1)$	-1.14	-3.87**
	Adjust R^2		0.89
	F-statistic, (5,8)		21.57
	Serial correlation, LM(1)		0.37
	Functional form		6.59
	Heteroscedasticity		0.10

Equation (14) $tx = \sigma_1 y^w + \sigma_2 (e - p) - \sigma_3 T$			
VAR (1)	$ecml(-1)$	-0.32	-1.37*
VAR (2)	$dy^w 1$	-1.14	-0.77
	$d(e - p)1$	0.26	1.58*
	$ecml(-1)$	0.10	1.48*
	Adjust R^2		0.01
	F-statistic, (4,9)		1.04
	Serial correlation, LM(1)		0.01
	Functional form		0.96
	Heteroscedasticity		0.70
Equation (15) $tm = \tau_1 y^d - \tau_2 (e - p) - \tau_3 T$			
VAR (1)	$ecml(-1)$	0.01	0.24
VAR (2)	$dy^d 1$	0.07	0.33
	$d(e - p)1$	-0.06	-0.46
	$ecml(-1)$	-0.07	-0.68
	Adjust R^2		0.05
	F-statistic, (4,9)		0.83
	Serial correlation, LM(1)		0.77
	Functional form		7.65
	Heteroscedasticity		0.06
Equation (16) $\hat{f}_t = \rho_1 (tx - tm) + \rho_2 (r^w f + e - p)$			
VAR (1)	$ecml(-1)$	-1.38	-5.02**
VAR (2)	$d(tx - tm)1$	-1.46	-1.92*
	$d(r^w f + e - p)1$	-1.71	-2.62*
	$ecml(-1)$	-0.37	-0.48
	Adjust R^2		0.65
	F-statistic, (4,8)		6.95
	Serial correlation, LM(1)		0.03
	Functional form		7.03
	Heteroscedasticity		0.85
Equation (19) $y^s = \lambda_1 k^p + \lambda_2 k^e + \lambda_3 k^g - \lambda_4 (w - p)$			
VAR (1)	$ecml(-1)$	0.46	6.10**

Note:

- The dependent variable in each equation is first-differenced, for example, dependent variable in Equation (1) is: $dy^d = y^d - y^d(-1)$.
- For VAR (2) the independent variables in each equation are the first-differenced variables lagged one period, for example, in Equation (2) $dy^s 1 = y^s(-1) - y^s(-2)$.
- VAR (2) cannot be calculated for Equation (1) and (19) because of a short length of observations.
- * means the estimated t -values are significant at the 5 per cent level; ** means the estimated t -values are significant at the 1 per cent level.

As can be seen from Table 6.6, the ECM equation for aggregate demand, (y^d) (Equation 1), based on cointegrating VAR(1), 2.56, is statistically significant at 1 per cent but has the wrong sign. However, in the case where the order 2 is chosen for the underlying VAR, the model cannot be calculated due to the lack of sample data. The ECM equation for private consumption, (c^p) (Equation 2), based on cointegrating VAR(1), -1.26, has the correct sign and is statistically significant at 1 per cent. For VAR(2) all estimated short run elasticities can be obtained as presented in Table 6.6. The econometric model is well specified, satisfying a range of diagnostic tests for model adequacy. These include the Lagrange Multiplier test for first order serial correlation and Ramsey's tests for functional form and heteroskedasticity.

For the ECM of the demand for real money balances, ($m - p$), Equation (9), in the case that the chosen order of VAR was one, the coefficient of the error-correction term is statistically insignificant with a very small value (0.002) and has the correct sign. For VAR(2), the estimated equation passes all the diagnostic tests. The LM test for serial correlation, Ramsey's test, and heteroskedasticity. The coefficient of the error-correction term is statistically not significant, while it has the correct sign. For domestic private sector wealth, (w^p) (Equation 10), the error-correction coefficient for VAR(1), estimated at -0.16, is statistically significant at the 1 per cent level and has the correct sign. For VAR(2), the error-correction term is larger (-1.14) and is also statistically significant at the 1 per cent level. The equation passes all diagnostic tests.

For total export demand, (tx), the error-correction terms have the correct signs for both VAR(1) and VAR(2). The particularly low speed of adjustment, as seen from the error-correction term (0.1), may be reliable due to the fact that Vietnam is a price taker in export goods. In the ECM equation for total import demand, (tm) (Equation 15), in the case where the chosen order of VAR was one, has a coefficient of the error-correction term, 0.01, that has the wrong sign. For the VAR(2), the error-correction term is -0.07 but is not statistically significant at all levels. The equation passes all diagnostic tests.

Equation (16) represents the current account balance, $(j_{+} - j_{-})$. The error-correction coefficient for VAR(1), estimated at -1.38 , is statistically significant at the 1 per cent level but has the correct sign, while it is not statistically significant for the case when the chosen order of VAR was two. The equation passes all diagnostic tests. For the aggregate supply of output, (y^s) (Equation 19), the error-correction coefficient for VAR(1) estimated at 0.46 , is highly statistically significant but has the wrong sign. However, in the case where the order 2 is chosen for the underlying VAR, the model cannot be calculated due to the lack of sample data.

6.5 Applications of the Bootstrap Method

The estimation methods that were used in the previous sections are largely asymptotic. It is argued that inference based on asymptotic distribution has two major drawbacks: (i) the estimators, though consistent (and often super consistent) have substantial small sample biases; and (ii) the tests of significance based on the asymptotic distribution have substantial size distortions (Li and Maddala, 1997). The purpose of this section is to investigate the usefulness of the bootstrap methods, which was initiated by Efron (1979), in providing some corrections to small sample biases in the estimated parameters generated previously.

The bootstrap method is a re-sampling method. Several re-sampling methods were in use earlier but they were disparate. Efron (1979) made the re-sampling method a widely applicable technique. The purpose of the bootstrap method is to reduce bias and provide more reliable standard errors. The bootstrap randomly picks a fixed number of observations from the original sample with replacements. By repeating this random re-sampling procedure, the bootstrap can approximate the unknown true distribution of the estimator with the empirical ‘bootstrap’ distribution. The bootstrap re-sampling method was originally designed for independent and identically distributed (I.I.D) errors. There are several bootstrap methods in the literature: simple bootstrap, double bootstrap, weighted

bootstrap, wild bootstrap, recursive bootstrap, sequential bootstrap, and so on. Many empirical applications in econometrics do not say which bootstrap is being used although one can infer that the simple bootstrap is being used (Jeong and Maddala, 1993). There appears to be a lot of confusion in the applied econometric literature about what the bootstrap is good for. In general, there are two main uses of the bootstrap that have both sound theoretical justification and support from Monte Carlo or experiment work. First, in models where asymptotic theory is intractable, the bootstrap can provide a tractable way to achieve confidence intervals, etc. Typically, these results are equivalent to those obtained through asymptotic theory. Second, in the models where asymptotic theory is tractable but not very accurate in samples of sizes used in applications, the bootstrap often provides a way of improving on the approximations of asymptotic theory. This section proceeds by applying the simple bootstrap⁴⁵ to the ordinary least square, and unit root tests introduced in the previous sections in order to check the accuracy of the results obtained.

6.5.1 Bootstrap in OLS regressions and empirical results

Consider a regression model $y = \beta X + u$ where y is an $n \times 1$ vector of the dependent variable, X is an $n \times k$ matrix of k regressors, and u is an $n \times 1$ vector of I.I.D errors with mean 0 and variance σ^2 . The true distribution of u is not known. The sampling distribution, or the mean and variance of an estimator $\hat{\beta}$ (the OLS estimator) are of interest.

When the regressors are non-random, the fixed structure of the data should be preserved and the bootstrap estimation is done by re-sampling the estimated errors. The procedure is:

- (1) Compute the predicted residuals $\hat{u} = y - \hat{\beta}X$ ⁴⁶.

⁴⁵ The bootstrap method used here is one with I.I.D errors. For the bootstrap methods with non-I.I.D errors see Jeong and Maddala (1993).

⁴⁶ If X does not include the constant vector so the residual \hat{u} are not centred, the bootstrap usually fails. Freedman (1981) recommends the use of the centred residuals, $\hat{u} - \sum \hat{u}_i / n$, to correct this problem.

- (2) Resample \hat{u} : obtain u^* by drawing n times at random with replacement from \hat{u} .
- (3) Construct a “fake data” y^* by the formula $y^* = \hat{\beta}X + u^*$.
- (4) Re-estimate β^* using X and y^* .
- (5) Repeat (2) – (4) m times.
- (6) Compute the bootstrap point estimator, $\hat{\beta}_B = \Sigma \beta_j^* / m$.
- (7) Compute the bootstrap variance of $\hat{\beta}$, $\hat{V} = \Sigma (\beta_j^* - \hat{\beta}_B)(\beta_j^* - \hat{\beta}_B)' / (m - 1)$.

The bootstrap OLS is defined as $\hat{\beta}_B = E[(X'X)^{-1}X'y^*]$ and Efron (1979) has shown that $E(\hat{\beta}_B) = \hat{\beta}$, $\text{var}(\hat{\beta}_B) = \sigma^2(X'X)^{-1}$; that is the bootstrap estimator is identical to the usual OLS estimator. Refitting the model to the resampled ‘fake data’, the Monte Carlo distribution of the observed errors in the parameter estimates can be used to approximate the distribution of the unobservable errors in the real parameter estimates. This is particularly useful in situations when it is believed that bias is a problem in small sample size.

Given the aforementioned problem of small sample size (there are only 16 observations), these steps are taken for determining the variability of parameter estimates in the eight behavioural equations previously calculated. The actual programming steps are taken from the SHAZAM illustration ‘*Bootstrapping Regression Coefficients*’. The results are shown in Table 6.7 and can be explained as follows.

Column (1) displays OLS estimator ($\hat{\beta}$). Column (2), obtained from step 6 as identified previously, shows for each parameter the sample mean for 1000 estimates. Column (3) shows the sample standard deviations, which are the bootstrap estimates of variability in the parameter estimates. The key questions now are how good are the OLS coefficient estimates and are they biased? To answer these questions one has first to compare column (1) and (2) in Table 6.7. For instance, the coefficient \hat{i} for total productive investment was set to the estimated value 0.197 in the construction of the ‘fake data’ (pseudo-data). However, the 1000 coefficient \hat{i}^* had a sample average 0.201. The

discrepancy as shown in column (4) is 0.0035. A standard error for the discrepancy can be calculated from the standard deviation of the \hat{i}^* (shown in column (3)) divided by the square root of the number of replications, $0.0935/\sqrt{1000} = 0.00296$. The t -value (shown in column (5)) is $0.0035/0.00296 = 1.1973$, which is not significant on 95 degrees of freedom so the bias is not significant. As can be seen from column (5) of Table 6.7, no coefficient of the estimated equations is significantly biased. So the answer for the above questions is that the OLS parameter estimates may be good and reliable. To support this answer the shapes of the bootstrap distribution (see Figure 6.6) may be of some interest. All the coefficient estimates are close to normally distributed, as may be anticipated.

Table 6-7: OLS Estimation and Bootstrap Experiment¹ for the Behavioural Equations

	OLS estimated coefficients (1)	Bootstrap		Discrepancy between (1) and (2) (4)	<i>t</i> - values of the discrepancy ² (5)
		Means of estimated coefficients (2)	Standard deviation of coefficients (3)		
Equation 1					
Private consumption (c^p)	0.88998	0.89073	0.0806	0.00075	0.29426
Total investment (i)	0.19727	0.20081	0.0935	0.00354	1.19727
Government consumption (c^g)	-0.18461	-0.19019	0.1381	0.00558	1.27773
Government investment (i^g)	0.10650	0.10698	0.0483	0.00048	0.31426
Trade balance ($tx - tm$)	0.01850	0.01821	0.0104	0.00029	0.88179
Equation 2					
Aggregate output (y^s)	1.01430	1.01180	0.07659	0.0025	1.03221
Private wealth (w^p)	-0.06467	-0.06289	0.06657	0.0018	0.84554
Equation 9					
Aggregate demand (y^d)	-1.1586	-1.1566	0.22571	0.0020	0.28021
Domestic interest rate (r)	-0.2241	-0.22498	0.06569	0.0009	0.42363
Private wealth (w^p)	1.2098	1.2075	0.19506	0.0023	0.37287
Equation 10					
Real foreign assets ($f + e - p$)	0.11541	0.11542	0.034696	0.0000	0.00911
Real money supply ($m - p$)	0.79232	0.79057	0.068585	0.0018	0.80688
Private capital stock ($k^p + q$)	0.61942	0.62072	0.55103	0.0013	0.07461
Equation 14					
World income (y^w)	2.0213	2.0220	0.10402	0.0007	0.21281
Real exchange rate ($e - p$)	0.14278	0.1388	0.08011	0.0040	1.57107
Equation 15					
Domestic income (y^d)	0.44286	0.44504	0.05368	0.00218	1.28423
Real exchange rate ($e - p$)	-0.71989	-0.72753	0.17956	0.00764	1.3455

Equation 16					
Trade balance ($tx - tm$)	0.61621	0.61528	0.33951	0.00093	0.08662
Real foreign interest income ($r^w f + e - p$)	-0.02526	-0.02715	0.12246	0.00189	0.48805
Equation 19					
Private capital stock (k^p)	0.46148	0.46550	0.10049	0.0040	1.26504
SOE capital stock (k^e)	0.46102	0.45522	0.21118	0.0058	0.86851
Government investment (k^g)	-0.12552	-0.12202	0.20670	0.0035	0.53546
Real domestic wage ($w - p$)	0.69023	0.68019	0.46876	0.0100	0.67730

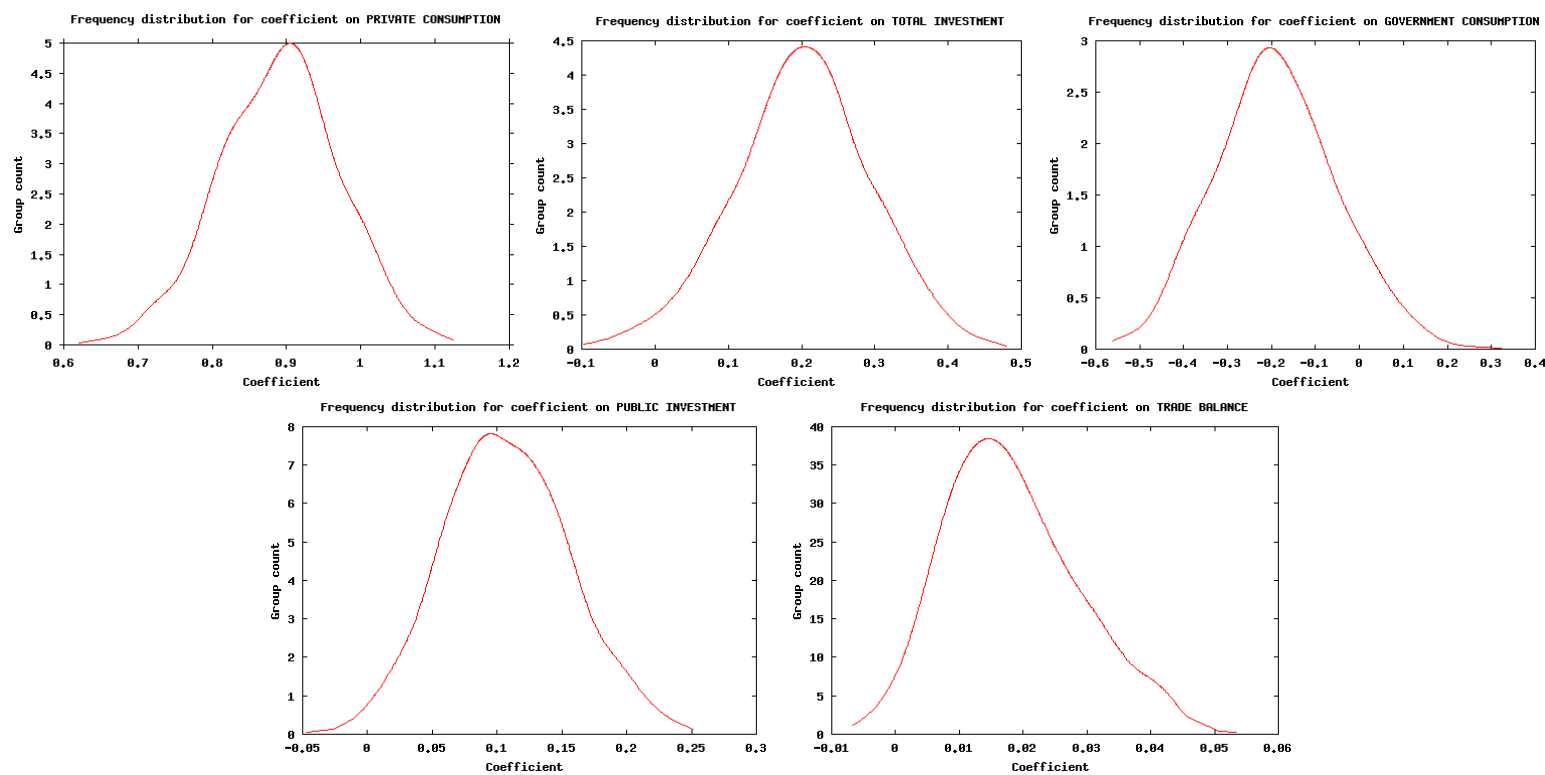
Note:

- ¹ There are 1000 bootstrap replications.

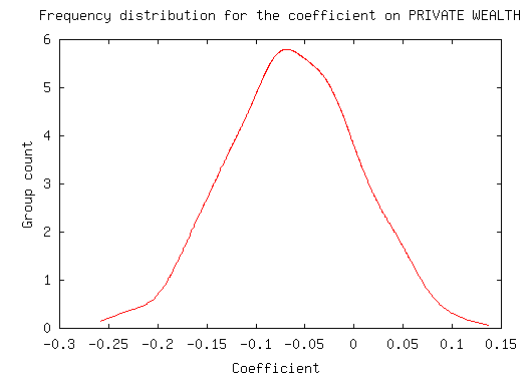
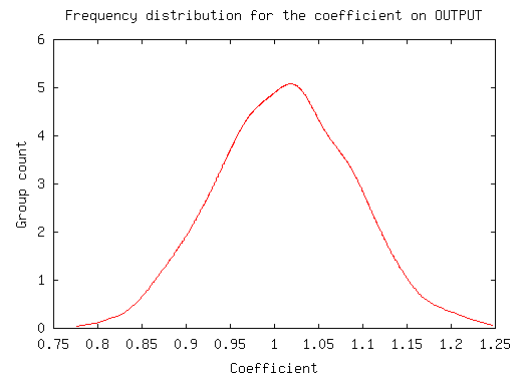
- ² The t - value (column 5) is calculated as follows: $Column (5) = \frac{Column (4)}{Column (3) / \sqrt{1000}}$

Figure 6-5: The Polygon of the Distribution for the Coefficients

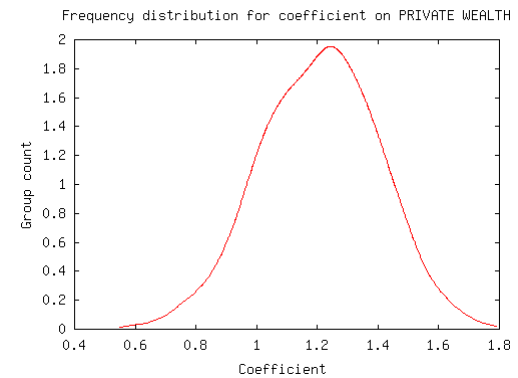
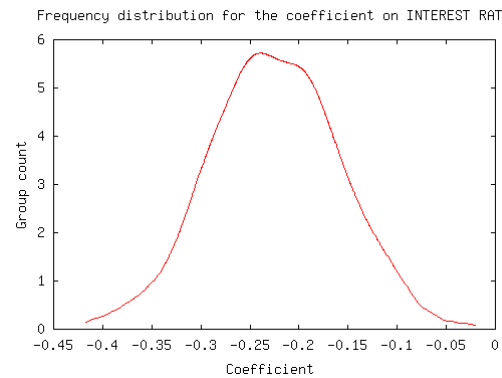
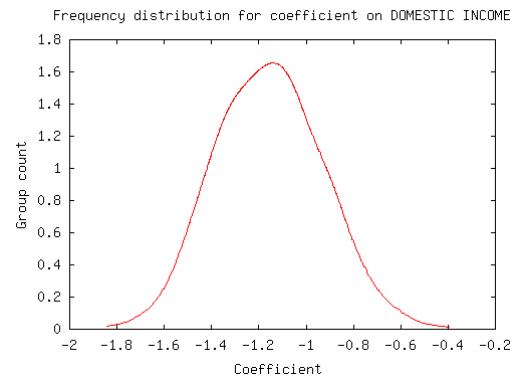
Equation 1 $y^d = \alpha_1 c^p + \alpha_2 i + \alpha_3 c^g + \alpha_4 i^g + \alpha_5 (tx - tm)$



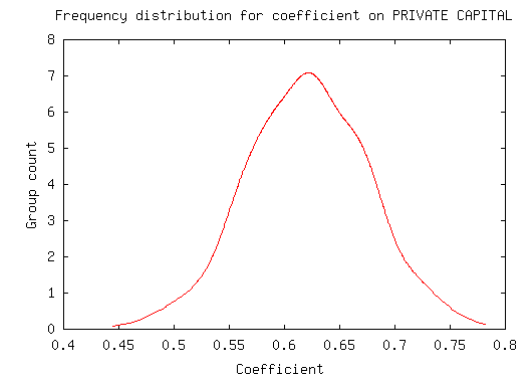
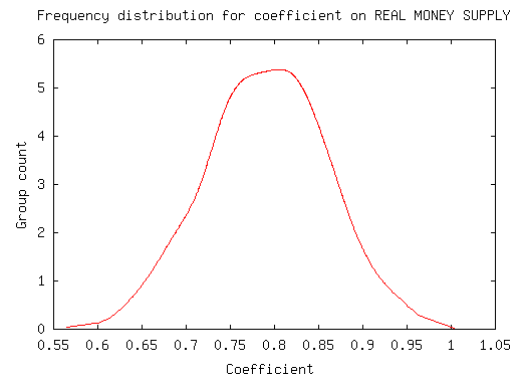
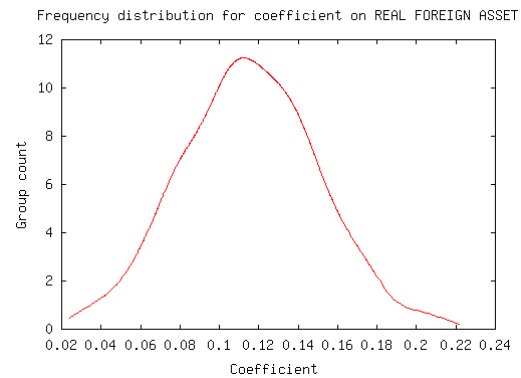
Equation 2 $c^p = c_1 y^s + c_2 w^p$



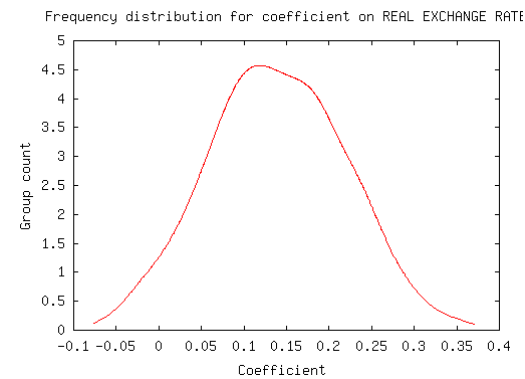
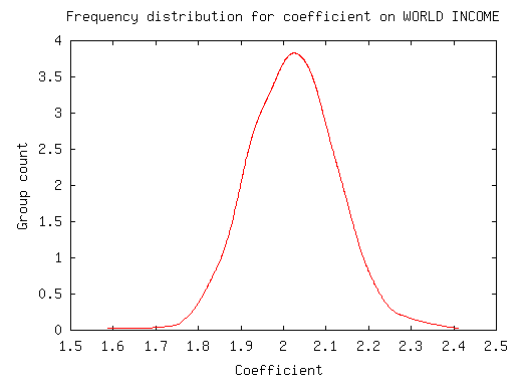
Equation 9 $m = p + \omega_1 y^d - \varpi_2 r + \varpi_3 w^p$



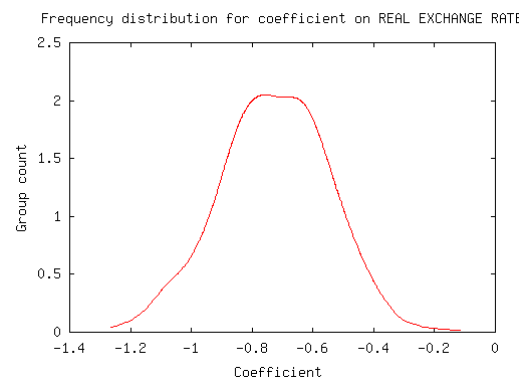
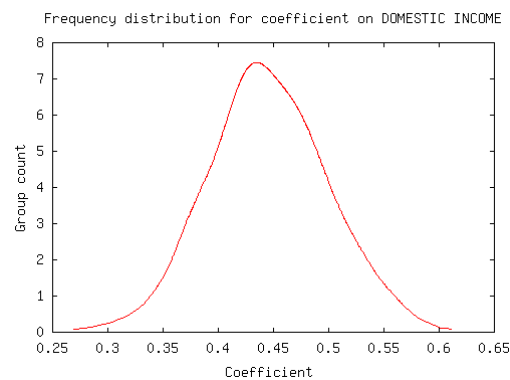
$$\text{Equation 10} \quad w^p = \mu_1(f + e - p) + \mu_2(m - p) + \mu_3(k^p + q)$$



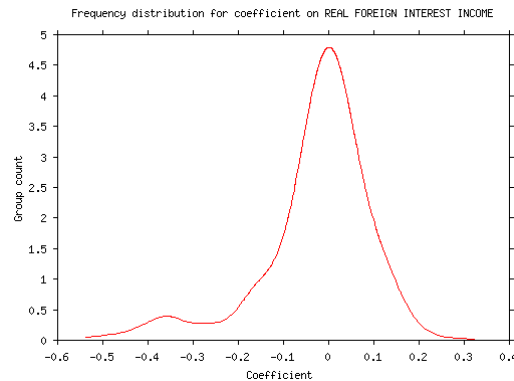
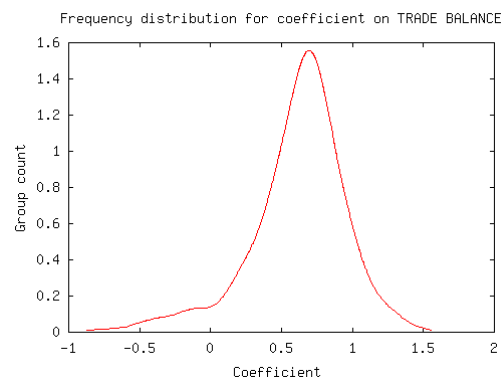
$$\text{Equation 14} \quad tx = \sigma_1 y^w + \sigma_2(e - p) - \sigma_3 T$$



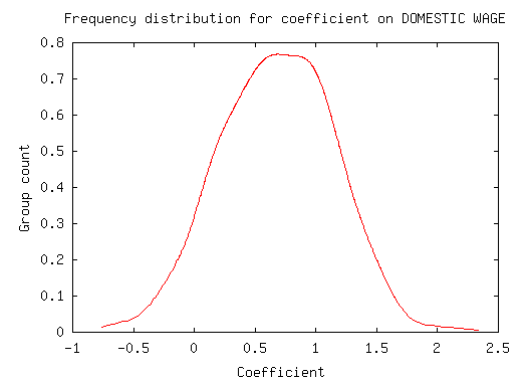
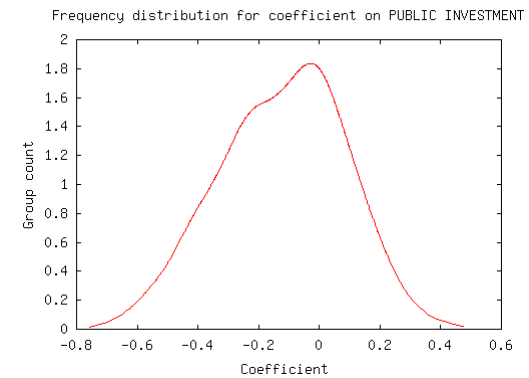
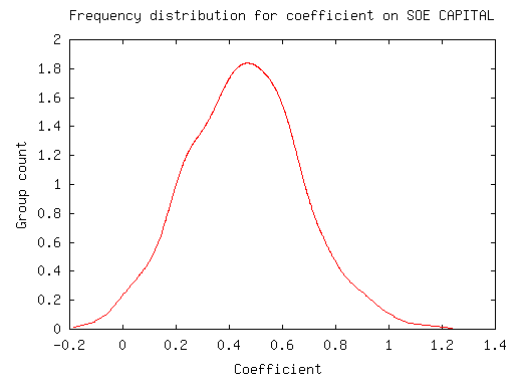
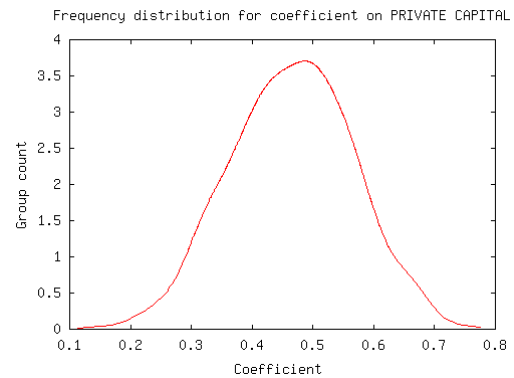
$$\text{Equation 15 } tm = \tau_1 y^d - \tau_2 (e - p) - \tau_3 T$$



$$\text{Equation 16 } \beta_1 + \beta_2 = \rho_1 (tx - tm) + \rho_2 (r^w f + e - p)$$



Equation 19 $y^s = \lambda_1 k^p + \lambda_2 k^e + \lambda_3 k^g - \lambda_4 (w - p)$



6.5.2 Bootstrap for unit root tests⁴⁷

There are a number of tests for a unit root, with the most popular being the Sargan-Bhargava (1983) CRDW test, the Dickey-Fuller (DF) test, the augmented Dickey-Fuller (ADF) test, and the tests developed by Phillips and Perron based on the Phillips (1987) Z test. In Section 6.4.1 the ADF test was used to test for the unit roots of nineteen variables used in the estimation of the developed model. However, when only a small sample size is available there is concern with the power and size of the tests of the unit roots. Given this problem the restricted Equation (6.2): $\Delta Y_t = \mu + \sum_{j=1}^p \theta \Delta Y_{t-j} + \varepsilon_t$ (see Section 6.4.1) can be estimated for each of the variables under consideration and then bootstrapped⁴⁸. On the basis of Monte Carlo replications, it is possible to compute both the size of the test and the power of the test.

For the size of the test it means to locate the percentage of times the null $\rho = 0$ is rejected, given a random sample drawn from the ε_t^* based on $\rho = 0$, which are then used to generate new values of Y_t^* for $\rho = 0$. For the power of the test it means to locate the percentage of times the null $\rho = 0$ is rejected, given a random sample drawn from the ε_t^* based on $\rho \neq 0$, which are then used to generate new values of Y_t^* for $\rho \neq 0$ ⁴⁹.

The results from using ADF tests on the variables in the eight behavioural equations were given in Table 6.4, and these suggest that fifteen out of the nineteen variables are non-stationary (see Section 6.4.1). Given the problem of small sample size, the following steps are taken to ascertain the size of the ADF test⁵⁰.

- (1) The restricted ADF equation (Equation 6.2) was estimated with $\rho = 0$ for each of the variables Y_t to obtain ε_t^* ;

⁴⁷ This approach is applied from Harris (1992)

⁴⁸ The restriction imposed is to initially set $\rho = 0$. This is necessary to ensure the validity of the bootstrap if there is a unit root. Note also that the ε_t can be tested to ensure that they are I.I.D, although choosing a larger value of p in equation (6.2) is often sufficient to ensure this occurs.

⁴⁹ This study focuses on the size of the test only.

⁵⁰ The actual programming steps were taken from SHAZAM 'Bootstrapping Regression Coefficients'.

- (2) 1000 random samples (with replacement) of the ε_t^* were drawn from the centred normalised residuals $\varepsilon_t^*/(1 - kn^{-1})^{1/2}$ (where k denotes the number of regressors in the model with n observations), to dynamically generate new values of Y_t^* with ρ^* set to 0;
- (3) The Y_t^* were used to estimate the unrestricted ADF equation (ρ^* free to vary), and a bootstrapped distribution of t -value ($t_{\hat{\rho}}^*$) and F -value (Φ^*) were obtained (based on the 1000 replications);
- (4) The $t_{\hat{\rho}}$ and Φ^{51} from Table 6.4 were located in the bootstrapped distribution of t -values ($t_{\hat{\rho}}^*$) and F -value (Φ^*) to obtain the significance level for rejecting the null (see Table 6.8).

Table 6-8: Significance Level¹ for Rejecting the Null of a Unit Root
(based on 1000 replications)

	Variables	$P(\hat{\tau}_{\tau}^* < \hat{\tau}_{\tau})$	$P(\Phi_3^* > \Phi_3)$
1	Aggregate supply of output (y^s)		0.416
2	Private real consumption (c^p)	0.011	0.416
3	Government consumption (c^g)		0.130
4	Private real wealth (w^p)	0.876	
5	Real money supply ($m - p$)	0.911	0.414
6	Domestic price level (p)	0.287	0.552
7	Domestic nominal interest rate (r)	0.945	0.119
8	Foreign asset stock ($f + e - p$)	0.586	
9	Real exchange rate ($e - p$)		
10	Total exports (tx)	0.894	
11	Total imports (tm)	0.814	0.415
12	Real foreign interest earnings ($r^* f + e - p$)	0.672	0.187
13	World real income (y^*)	0.794	0.731
14	Current account balance (f)	0.377	
15	Nominal exchange rate (e)	0.536	0.176
16	SOE investment capital stock (k^e)		
17	Private investment capital stock (k^p)	0.043	0.081
18	Government investment expenditure (k^g)		
19	Domestic real wage ($w - p$)	0.856	

Notes: - ¹ The proportion of the bootstrapped t -values (F -values) generated with $\rho^* = 0$ less (greater) than the t -values (F -values) in Table 6.4.

⁵¹ The study presents $\hat{\tau}_{\tau}$ - and Φ_3 -statistics only (see Section 6.4.1)

The results in Table 6.8 show that, in the case of the drift and trend model, 28.7 per cent of the domestic price level (p), for example, t -values generated with $\rho = 0$ were less than the actual t -value of -2.06 (see Table 6.4). In other words, given the bootstrap distribution, the null would be rejected only if the significance level were as large as 28.7 per cent. In itself, this might be viewed as evidence that the domestic price variable is possibly non-stationary, especially given the significance level of 55.2 per cent for rejecting the null that $\rho = \alpha = 0$ (Φ_3). The explanations for other variables are the same. For some variables such as private real wealth (w^p), real money supply ($m - p$), domestic nominal interest rate (r), total exports (tx) the rejection of the null is much weaker (for these variables the null that they are non-stationary can be rejected at around the 90 per cent significance level). The results are also different among the ADF tests with drift and without drift. In Table 6.8 three variables, namely real exchange rate ($e - p$), SOE investment capital stock (k^e), and government investment expenditure (k^g), are always stationary based on both the ADF test and the bootstrap distribution, although this may be inconclusive as far as the informal examination by graphing (see Figure 6.2) is concerned. Thus, using the small sample empirical distributions of the ADF statistic, based on the stochastic structure of the data generated process (d.g.p) underlying the data, a different result is obtained with regard to whether all the variables being tested are $I(1)$ or $I(0)$ (Harris, 1992). This comes about because the small sample critical values are greater than Fuller's (1976) estimates (which are based on a sample size of 50).

Having assumed that the variables are non-stationary and integrated of order $I(1)$, a cointegration vector between the variables possibly exists. Eight behavioural equations were estimated and tested for stationarity based on both the EG and CRDW tests, with the results given in Table 6.5 in Section 6.4.2.

6.6 A synthesis of the estimated results

To provide a range of possible parameter values that can be used in the simulation analysis conducted in Chapter 7 this chapter has explored at least four estimation approaches, namely OLS regressions, iterative Cochrane-Orcutt estimation, error-correction model, and bootstrap estimation (to adjust for small sample bias). The estimation results obtained from these approaches are synthesised in Table 6.9.

Overall, the parameter estimates obtained from the OLS regressions of the logarithm variables are satisfactory in spite of some parameters having theoretically unexpected signs or are statistically insignificant at the 10 per cent level. This may be due to multicollinearity. Given the relatively high value of the R^2 , it can be said that the endogenous variables have predicted reasonably well. However, the value of the Durbin-Watson statistics may be of concern about serial correlation in the residuals of these equations. To remedy the problem of autocorrelation the iterative Cochrane-Orcutt procedures were used to re-estimate these equations. Compared with the results obtained from the OLS regressions the coefficients of the explanatory variables from this approach are not much different. However, their statistics are much improved, especially the magnitude of the DW statistics being close to 2.

The estimation methods that were used above are largely asymptotic. It is argued that for the case of small sample inference based on asymptotic distribution there are some major drawbacks. In providing some corrections to small sample biases in the estimated parameters the bootstrap method is investigated with the help of the SHAZAM program. With relatively small values of the standard deviation of the coefficients (see Table 6.7) the results obtained from this approach once again confirm the fact that no coefficients of the estimated equations are significantly biased.

However, the estimation of the model using the OLS regressions as presented was based on economic time series which are clearly non-stationary in the sense that the mean and variance depend on time, and they tend to depart ever further from any given value as

time goes on. It is argued that regression of one non-stationary variable on another is very likely to yield regression results which are *nonsense* (named by Yule, 1926) or *spurious* (the terminology of Granger and Newbold, 1974). An alternative modelling testing approach dealing with non-stationary, or integrated, time series data is the concept of cointegration. Since an informal as well as formal examination of the Vietnamese data confirms that non-stationary is apparent in all the series, regressions of these series are meaningful if and only if they involve cointegrated variables. Two simple tests for cointegration between variables are applied. One is proposed by Engle and Granger, testing for the existence of a unit root in the residuals of the static regression, and another suggested by Sargan and Bhargava (1983) is the cointegrating regression Durbin-Watson test (CRDW). Since in absolute terms the estimated t value for the residuals of the behavioural equations exceeds the critical value at 5 per cent, the conclusion is that the residuals for these regressions are $I(0)$; that is, they are stationary. The results from the CRDW test also give the same conclusion. Hence, the OLS regressions would not be spurious, even though the individual variables are non-stationary, and can be called cointegrating regressions⁵². In this case, it can be said that the variables in the behavioural equations are cointegrated.

In an error correction model (ECM) the dynamics of both short run (changes) and long run (levels) adjustment processes are modelled simultaneously. This idea of incorporating the dynamic adjustment to steady-state targets in the form of error correction terms therefore offers the possibility of revealing information about short run and long run relationships. In this study ECMs are estimated by the application of the maximum likelihood cointegration technique of Johansen (1988). The optimal lag length of one for VAR was chosen for Equations (1) and (19) and of two for the remaining equations. The results of these tests (not shown here) suggest that there exists one cointegrating relationship between $I(1)$ variables. Column (5) of Table 6.9 reports the coefficient estimates of these cointegrating vectors which are normalised on the dependent variables of

⁵² This is used in the sense given by Gujarati (2003), p. 822.

the behavioural equations. The finding of estimated cointegrating vectors allows us to formulate the short run adjustment process in terms of ECM. The coefficients of the error correction terms are reported in Table 6.6.

As can be seen from Column (5) of Table 6.9 the estimated coefficients obtained from cointegrating vectors have reasonable magnitudes, which are not much different from those of the OLS regressions (except Equations (9) and (19)), and also have the same signs. Since the error correction term is assumed to enter its own equation with a negative sign supporting the error correction interpretation, if it is statistically significant it can tell us what proportion of the disequilibrium in the dependent variable in one period is corrected in the next period. The important finding from the ECMs is that the coefficients of the error correction term of Equations (2), (10), and (16) have the correct signs and are statistically significant at the 5 per cent level, suggesting a moderate speed of convergence to equilibrium⁵³. The error correction terms of Equations (9) and (14), while they display the correct signs, are not statistically significant. For the remaining equations the error terms have the wrong signs. This finding to some extent confirms that the estimated equations are well specified and the parameter estimates obtained from cointegrating vectors are reliable.

In conclusion, although having been affected by a serious “degrees of freedom” problem, the OLS regression based on the levels of the logarithm variables seems to give reliable coefficients in terms of their magnitudes. This conclusion is confirmed when several other approaches are conducted to check for similar results. Therefore, it can be useful in providing a range of possible parameter values to be used in the simulation analysis conducted in Chapter 7.

⁵³ Equilibrium as used in the context of the cointegrating regression and the ECM means a statistically observed relationship between the variables over the same period.

Table 6-9: A Synthesis of the Estimated Results

	OLS estimation		Iterative Cochrane-Orcutt estimation		ECM estimation ¹	Bootstrap estimation
	Coefficient value (1)	<i>t</i> -ratio (2)	Coefficient value (3)	<i>t</i> -ratio (4)	Coefficient value (5)	Coefficient value (6)
Equation (1)						
c^p	0.89	10.89	0.98	12.28	0.67	0.89073
i	0.20	2.11	0.10	0.98	0.54	0.20081
c^g	-0.19	-1.30	-0.05	-0.40	-0.51	-0.19019
i^g	0.11	2.14	0.04	1.00	0.30	0.10698
$(tx - tm)$	0.02	1.82	0.003	0.32	-0.02	0.01821
		$R^2 = 0.99$ DW = 1.60		$R^2 = 0.99$ DW = 2.18		
Equation (2)						
y^s	1.01	13.68	0.97	23.10	0.79	1.01180
w^p	-0.07	-1.0	-0.06	-1.66	0.04	-0.06289
		$R^2 = 0.99$ DW = 0.57		$R^2 = 0.99$ DW = 2.08		
Equation (9)						
y^d	-1.16	-5.30	-1.52	-5.83	-5.71	-1.1566
r	-0.22	-3.44	-0.46	-3.60	-2.12	-0.22498
w^p	1.21	6.39	1.33	7.51	2.76	1.2075
		$R^2 = 0.95$ DW = 1.40		$R^2 = 0.95$ DW = 1.88		
Equation (10)						
$(f + e - p)$	0.12	3.51	0.33	2.62	0.04	0.11542
$(m - p)$	0.79	11.19	0.45	1.90	1.21	0.79057
$(k^p + q)$	0.62	11.73	0.60	3.23	0.20	0.62072
		$R^2 = 0.99$ DW = 1.43		$R^2 = 0.99$ DW = 2.07		
Equation (14)						
y^w	2.01	19.54	1.97	7.94	1.92	2.0220
$(e - p)$	0.14	1.79	0.23	0.92	1.50	0.1388
		$R^2 = 0.97$ DW = 1.08		$R^2 = 0.95$ DW = 1.93		
Equation (15)						
y^d	0.44	7.90	0.65	2.15	1.18	0.44504
$(e - p)$	-0.72	-4.02	0.14	0.53	-0.38	-0.72753
		$R^2 = 0.83$ DW = 1.18		$R^2 = 0.93$ DW = 2.13		
Equation (16)						
$(tx - tm)$	0.66	4.27	0.73	4.00	0.44	0.61528
$(r^w f + e - p)$	-0.07	-0.74	-0.30	-1.40	-0.39	-0.02715
		$R^2 = 0.87$ DW = 1.76		$R^2 = 0.91$ DW = 1.55		

Equation (19)						
k^p	0.46	4.58	0.31	2.00	0.97	0.46550
k^e	0.46	2.14	0.54	3.01	-2.59	0.45522
k^g	-0.13	-0.60	-0.05	-0.29	3.13	-0.12202
$(w - p)$	0.69	1.45	0.32	0.61	2.36	0.68019
		$R^2 = 0.99$ DW = 1.59		$R^2 = 0.99$ DW = 1.3		

Note:

- ¹ ECM results estimated by OLS based on cointegrating VAR (1) for Equations (1) and (19), and VAR (2) for the remaining equations.
- The coefficient values of the ECM model are the cointegrating coefficients.

6.7 Conclusions

This chapter aimed to empirically estimate the model developed in Chapter 5. A simple estimation method – OLS – was explored first. Broadly, the estimated results are good in terms of diagnostic test statistics such as t - values, and the coefficient of determination (R^2). Some coefficients have *a priori* expected signs whilst others are not statistically significant and have the wrong signs, probably due to multicollinearity. The especially low Durbin-Watson statistics in some equations, however, suggest that the variables in these equations are autocorrelated. The diagnostic statistics were improved when the iterative Cochrane-Orcutt procedure, OLS regressions of the first- and second differenced variables were applied, although the parameter estimates obtained from these approaches are not significantly different from those derived from the levels regression.

The OLS regression analysis based on time series data implicitly assumes that the underlying time series are stationary. However, it is a well-known empirical fact that many macroeconomic time series are typically non-stationary. It is argued by time-series analysts that regression of one non-stationary variable on another is inconsistent with most data and gives rise to spurious inferences. Nevertheless, cointegration analysis allows us to conduct econometric analysis of non-stationary variables.

Before proceeding to test the sets of variables for cointegration it is sensible to establish the properties of the individual series. An informal examination by graphing, as well as the application of the ADF, asserted the non-stationarity characteristics of the variables of interest. Having assumed that all the variables concerned are integrated in the same order, $I(1)$, testing for cointegration was done to determine whether a long run relationship exists between the variables. The results from the cointegration tests indicate the existence of long run relationships (or cointegration) for all the equations employed. The assumption of cointegration relationships between the variables concerned allows us to formulate the short run adjustment process in terms of an error correction model (ECM).

Having recognised that inference based on asymptotic distributions of the methods used has some drawbacks of small sample size biases, the bootstrap method, a computer-based methodology initiated by Efron (1979), was used to check the accuracy of the asymptotics to make alternative estimates of the standard errors that are more reliable for the case of OLS regressions and to compute the size of the unit root tests using the ADF approach. The results from Section 6.6 show that the coefficient estimates obtained from the OLS regressions were not significantly biased and the non-stationary characteristics of the variables under consideration were confirmed, although their orders of integration may be inconclusive due mainly to the limitation of the observation numbers.

A comparison of the estimated results obtained from the various approaches suggested that, with plausible magnitudes, a set of parameter estimates obtained from the OLS regression of the level variables can be used for policy analysis by means of a numerical simulation conducted in Chapter 7.

CHAPTER 7

SIMULATION ANALYSIS AND POLICY IMPLICATIONS

7.1 Introduction

In this chapter the model developed in Chapter 5 is utilised to conduct a number of numerical simulations. Since the size and complexity of the theoretical framework prevents the mathematical derivation of analytically unambiguous results, for both the steady state and dynamic properties of the model, a numerical simulation procedure⁵⁴ is used based on parameters derived from either the econometrically estimated results obtained from Chapter 6 or existing sources. The model must exhibit dynamic properties (see Appendix 7.1) which are consistent with the underlying behavioural assumptions, thereby ensuring, in the context of this rational expectations model, a stable saddlepath consistent with the attainment of long-run equilibrium. With the assumption of a fixed exchange rate the dynamic equations of the model are assumed to consist of a set of dynamic endogenous control variables, namely real money balances (M), foreign asset stocks (F), private capital stock (K^P), public capital stock (K^G), state-owned enterprise capital stock (K^E), nominal wages (W) and Tobin's q ratio (q). The first six of these, because of assumed stickiness of price and quantity adjustment in non-financial markets, are predetermined, or non-jump, variables. Tobin's q ratio, which is the ratio of the market valuation of the capital stock to its replacement cost, is the only non predetermined, or jump, variable because it is determined in financial markets

A simulation analysis, which can be described as a calibrated solution of the model, is conducted in Section 7.2 in order to derive certain conclusions about the effect of alternative paths for the Vietnamese economy, corresponding to different assumptions

⁵⁴ The numerical simulation procedure utilised is known as "Saddlepoint". It is a numerical algorithm developed by Austin and Buiter (1982) for solving systems of linear differential equations with constant coefficients, and is based upon the solution provided by Blanchard and Khan (1980) for the case of systems of linear difference equations. Its analytical solution is derived and discussed in Buiter (1982).

regarding policy changes and reforms. Three types of policy reforms in the simulation analysis will be assumed as exogenous shocks: (1) in carrying out privatisation it is assumed that 5 per cent of the capital stock of SOEs is given to the private sector; (2) the nominal exchange rate is assumed to be devalued by 5 per cent; (3) and the tariff rate is assumed to be reduced by 5 per cent. For each shock, the simulation will be carried out at different speeds. In the first case a gradual process will occur, while in the second case an immediate change will take place on impact. A comparison between them will then be conducted. Two extreme reform packages, involving a multitude of policy instruments designed to illustrate the more complex cases of gradualism and shock therapy approaches, will be eventually considered. In both simulations, privatisation, tariff reform, and devaluation are undertaken, with the only difference being the speed with which these actions are taken. The analysis will focus upon the adjustment of six key macroeconomic variables, namely the foreign capital stock, private capital stock, aggregate output supply, the trade balance, the real exchange rate, and inflation. These key variables are chosen because they are important factors in the process of economic development of Vietnam, affecting economic growth and economic stability. Any changes in these variables arising from policy shocks such as the nominal exchange rate devaluation, privatisation of SOE capital stocks and tariff reduction, will have an impact on the development of other variables and the domestic economy as whole.

In addition, the shocks involving the privatisation of the SOE capital stock and tariff reduction are considered in an alternative model, in which it is assumed that capital mobility is perfect and the nominal exchange rate is flexible⁵⁵. This will then be compared with the fixed exchange rate and imperfect capital mobility version of the model. The impact of the changes in government capital expenditure, combined with the reform

⁵⁵ In this version of the model there are seven dynamic endogenous control variables – real money balances (l), foreign capital stock (f), private capital stock (k^p), state-owned enterprise capital stock (k^e), public capital stock (k^g), Tobin's q (q), and real exchange rate (c), in which the first five variables are assumed to be predetermined non-jump variables, while q and c , being determined in financial markets, are non-predetermined jump variables.

policies on the Vietnamese economy, will also be explicitly analysed. The policy implications derived from these simulations will be presented in Section 7.3. The last section will present concluding remarks for this chapter.

7.2 Simulation Results

In order to identify the steady state properties of the model arising from a shock, as well as the adjustment process towards the long run steady state, it is necessary to specify the numerical values of the parameters of the model. The relevant parameter values used are either chosen from the coefficients obtained from the econometric estimation in Chapter 6 or imposed due to unsuccessful attempts to estimate them or in order to ensure model stability. Table 7.1 summarizes these.

Using the parameter values contained in Table 7.1 six scenarios arising from exogenous shocks, and their resulting impact upon six key macroeconomic variables, are presented in subsections 7.2.1-7.2.6 respectively. The resulting impact of each shock upon the adjustment of key macroeconomic variables is contained in Figures 7.1-7.6. The vertical axis for each diagram measures the percentage deviation of that variable from the baseline, its starting value, while the horizontal axis measures the time period. Each diagram breaks the adjustment process into four time periods. The impact period is that arising immediately on the announcement of the policy, or the time at which an exogenous shock occurs. The short run is described as that occurring over a period of one year, the medium run that occurring from two to three years and the long run three years onwards⁵⁶.

⁵⁶ The time periods have been arbitrarily identified. The simulation results presented were restricted to thirty time periods and assumed that each time period equals a half year. In Figures 7.1-7.6, 0-0* represents the impact period, 0*-2 represents the short run period (one year), 2-6 represents the medium run (two years) period and 6-onwards represents the long run period. In most cases the steady state is achieved at the fifteenth year or immediately after that.

Table 7-1: Parameters Chosen for the Simulation

Equation	Parameters	OLS estimated coefficients	Confidence intervals*		Chosen parameters for the simulation	Sources for imposed parameters
(1)	α_1	0.89	0.7	1.1	1.0	Estimated ^a
	α_2	0.20	-0.01	0.4	0.1	Estimated
	α_3	-0.19	-0.5	0.13	0.1	Estimated
	α_4	0.11	0.004	0.22	0.1	Estimated
	α_5	0.02	-0.004	0.04	0.1	Estimated
(2)	c_1	1.01	0.85	1.17	1.0	Estimated
	c_2	0.07	-0.2	0.1	0.1	Estimated
(3)	β				0.6	Author's calculation ^b
(4)	τ_1				0.5	Author's calculation
	τ_2				0.5	Author's calculation
(5)	η				0.5	(A), (B), (C)
(7)	θ				0.5	(A), (B), (C)
(8)	φ				0.4	Author's calculation
(9)	ϖ_1	-1.16	-1.64	-0.68	1.0	Estimated
	ϖ_2	0.22	-0.37	-0.1	0.2	Estimated
	ϖ_3	1.2	0.8	1.62	1.0	Estimated
(10)	μ_1	0.12	0.04	0.19	0.2	Estimated
	μ_2	0.8	0.64	1.0	0.5	Estimated
	μ_3	0.62	0.5	0.74	0.5	Estimated
(11a)	ψ				0.3	(A), (B), (C)
(12)	δ_1				0.5	(A), (B), (C)
	δ_2				0.5	(A), (B), (C)
	δ_3				0.5	(A), (B), (C)
(13)	ε_1				0.2	(A), (B), (C)
	ε_2				0.2	(A), (B), (C)
	ε_3				0.2	(A), (B), (C)
	ε_4				0.2	(A), (B), (C)
(14)	σ_1	1.3	0.86	1.76	1.0	Estimated
	σ_2	0.2	-0.18	0.56	0.2	Estimated

Equation	Parameters	OLS estimated coefficients	Confidence intervals*		Chosen parameters for simulation	Sources for imposed parameters
(15)	τ_1	0.38	0.28	0.48	0.4	Estimated
	τ_2	-0.48	-0.73	-0.22	0.3	Estimated
(16)	ρ_1	0.64	-0.14	1.4	1.0	Estimated
	ρ_2	-0.13	-0.58	0.32	0.2	Estimated
(17)	α				0.5	(A), (B), (C)
(18)	ϕ_1				0.7	(A), (B), (C)
	ϕ_2				1.0	(A), (B), (C)
(19)	λ_1	0.35	0.04	0.66	0.5	Estimated
	λ_2	0.5	-0.2	1.18	0.5	Estimated
	λ_3	-0.05	-0.68	0.57	0.1	Estimated
	λ_4	0.3	-1.1	1.7	0.3	Estimated

Note:

- (a) Estimated coefficients obtained from the OLS regressions identified in Chapter 6.
- (b) Author's calculation is based on Vietnamese data.
- * Confidence interval (95%) based on the t-distribution.
- (A) Harvie C. (1993), "The macroeconomic effects of oil shocks under fixed and flexible exchange rates – a comparison", *OPEC Review*.
- (B) Harvie C. and Kearney C. (1996), "Public infrastructure capital and private investment", *Research Paper*, The University of Wollongong.
- (C) Harvie C. and Lee B. C. (1996), "Financial deregulation and macroeconomic adjustment: the case of Australia", *Research Paper*, The University of Wollongong.

7.2.1 Simulation results arising from a nominal exchange rate devaluation

In this subsection the results derivable from simulating the model for the scenario of a devaluation in the nominal exchange rate is conducted. The presumed change is that of a 5 per cent devaluation in the nominal exchange rate. Two initial simulations are carried out in which the devaluation is implemented at different speeds. To simulate an instantaneous devaluation, the nominal exchange rate is devalued by 5 per cent⁵⁷ and this takes place instantaneously. To simulate a gradual devaluation, it is assumed that the nominal exchange rate is devalued by 3 per cent on impact, 1 per cent more after one year, and another 1 per cent in the second year. Table 7.2 summarises the long run steady state properties of each variable under consideration for both cases, in percentage deviation terms, from their initial base values. The adjustment process involved in this case, for either an up-front devaluation or a gradual devaluation, is contained in Figures 7.1A-7.1F.

Table 7-2: Simulation Results: Devaluation in the Nominal Exchange Rate (5 per cent)

% deviation from baseline

	Variables					
	f	k^p	y^s	t	c	p
Up-front devaluation						
Instantaneous impact	0	0	0.5	1.0233	5	1.0473
Short run impact	1.8831	-0.7719	-0.4679	0.0128	-0.8195	0.0626
Medium run impact	0.8751	-0.4791	-0.2837	0.0346	-0.4421	-0.002
Long run impact	0	0	0	0	0	0
Gradual devaluation						
Instantaneous impact	0	0	0.3	0.614	3	0.6284
Short run impact	15.441	-6.3304	-3.5971	0.5619	-4.3188	0.4261
Medium run impact	7.5047	-4.0777	-2.4189	0.2854	-3.8005	-0.0191
Long run impact	0	0	0	0	0	0

A nominal exchange rate devaluation produces important differences in the adjustment of the major macroeconomic variables to long-run steady state. As can be seen

⁵⁷ Because the model is linear a 5 per cent change in the exchange rate (or tariff reduction or privatisation) should be 5 times the effect of a 1 per cent change. Hence it is not the actual magnitude of the change itself but the direction of change, or impact, on endogenous variables that are of interest, both in steady state and during the adjustment period. It is not particularly important to assume a certain percentage change in an exogenous variable, it could be 1 or 5 per cent. The important issue is impact effects (positive or negative) and the size of these relative to the long run steady state changes.

from Table 7.2, however, there is no difference in the long-run steady state results for both immediate and gradual cases. In this case, a devaluation of the nominal exchange rate by 5 per cent is offset by an equi-proportional increase in the nominal domestic wage (not shown here⁵⁸). As a result there is no overall change in the macroeconomic variables in steady state.

Despite the similarity in the steady state results for both cases, the dynamics of adjustment are noticeably different. Taking domestic developments first of all, real GDP (y^s) shows a marginal increase on impact, by 0.5 per cent and 0.3 per cent with an up-front and gradual process respectively, due to the expenditure-switching effect of the devaluation. Over the short run developments in aggregate supply are very similar under either process, with a gradual decline apparent. Two factors that contribute to such a decline on the supply side are capital stock decumulation and the real exchange rate appreciation which causes a reduction in the competitiveness of the economy. By the end of the short run the level of aggregate supply under the gradual case bottoms out at 3.6 per cent lower than baseline, a point approximately eight times lower than that of the up-front case. The medium period sees an increase in aggregate supply, while under the up-front process aggregate supply increases slowly to the steady state. Over the long run a continual increase occurs and the up-front process achieves the long run steady state earlier.

The private capital stock (k^p) also shows a similar adjustment process to that of aggregate supply. As it is assumed to be an endogenous control variable that exhibits stickiness of adjustment, the private capital stock does not change on impact. The short run period sees a sharp decline in this variable for the case of a gradual devaluation with a fall of 6.3 per cent lower than base line, while this number stands at around 0.8 per cent for the case of an immediate devaluation. The reduction of the private capital stock can be attributable to an increase in the nominal interest rate (not shown here) arising from developments in the price level arising from the devaluation, and to a decline in the q ratio.

⁵⁸ The simulation results of some variables are not shown here because focus is placed primarily only on the adjustment of key macroeconomic variables, as mentioned in the first chapter.

After bottoming out by the end of the short run period, the private capital stock starts rising in the medium run due to a gradual decline in inflation and in the interest rate. Over the long run a gradual increase occurs for both cases, recovering thereafter to the long run steady state. With an up-front devaluation the private capital stock achieves the long run steady state much quicker than for the alternative gradual devaluation case.

External developments are shown by developments in the real foreign asset stock (f), the trade balance (t) and the real exchange rate (c). The foreign asset stock, assumed to be subject to stickiness of adjustment, does not change on impact and shows a similar adjustment pattern although with different magnitudes over the short run. By the end of the short run, the nominal foreign asset stock has reached its peak at 15.5 per cent above baseline with the gradual case, almost eight times higher compared to that of the immediate case (1.9 per cent). With the gradual approach the real foreign asset stock deteriorates over the medium run, but still being 7.5 per cent above baseline by the end of this period and declining gradually over the long run. Again, with an up-front devaluation the decline is a gradual one but with the size of adjustment less, and achieving the steady state much earlier.

The real exchange rate depreciates by exactly the same percentage as the nominal exchange rate devaluation (5 per cent) on impact in the up-front case, and by 3 per cent for the gradual case. In the short run the real exchange rate experiences an initial appreciation for both cases, further appreciating by some 1 per cent over the medium run before depreciating again to the long run steady state under the up-front devaluation. With the gradual process the real exchange rate continues to appreciate in the first year of the medium period, bottoming out at some 6 per cent in the medium run from the baseline, and depreciates thereafter until the steady state.

An initial improvement in the trade balance (t) for both cases is apparent, of 1 per cent and 0.6 per cent for the up-front and gradual processes respectively, primarily because of the initial strong impact of the nominal exchange rate devaluation, but the trade balance worsens in the remainder of the short run period as the devaluation effect is eroded by

inflation, indicating the real exchange rate appreciation. In the case of a gradual devaluation the first year of the medium run sees a further deterioration, but a slight improvement in the trade balance is apparent after the second year of this period. Over the long run the steady state is achieved quite rapidly with the up-front process, but greater volatility is apparent with the gradual process.

Finally, the adjustment of inflation (p) is very similar in direction under either case. The inflation rate rises to a level higher than baseline on impact, reflecting the effect of the nominal exchange rate devaluation on domestic prices. However, the economy does not experience an inflationary development from the medium run to the long run steady state irrespective of whether an up-front or gradual devaluation is imposed.

7.2.2 Simulation results arising from a tariff reduction⁵⁹

This subsection conducts two simulations on alternative tariff reform paths, involving a gradual and an up-front tariff reduction. The first simulation supposes that the tariff reduction is introduced gradually. It is assumed that a reduction from its base level occurs on impact by 3 percent and then 1 per cent more each year for the next two years. The second simulation assumes the reduction of the tariff rate by 5 per cent occurs immediately on impact. Table 7.3 summarises the long run steady state properties of each variable of interest, in percentage deviation terms from the initial baseline, for both cases. The adjustment process involved in this scenario is contained in Figures 7.2A-7.2F.

⁵⁹ Trade barriers in Vietnam are incorporated as non-tariff barriers rather than as high tariff rates. Hence trade liberalisation should really be studied as a reduction in quantitative restrictions. Such simulations, however, are beyond the scope of this study.

Table 7-3: Simulation Results: Tariff Reduction (5 per cent)
% deviation from baseline

	Variables					
	f	k^p	y^s	t	c	p
Up-front tariff reduction						
Instantaneous impact	0	0	0	0.4772	0	0.1164
Short run impact	1.5546	-0.1412	-0.2672	0.125	-1.9661	-0.0015
Medium run impact	1.2521	-0.1823	-0.2769	0.1724	-1.8581	0.0007
Long run impact	1.6702	-0.4134	-0.4134	0.19	-2.0668	0
Gradual tariff reduction						
Instantaneous impact	0	0	0	0.2863	0	0.0699
Short run impact	1.4704	-0.1919	-0.2559	0.2045	-1.6004	0.0302
Medium run impact	1.3299	-0.2183	-0.2991	0.1729	-1.8996	0.0001
Long run impact	1.6702	-0.4134	-0.4134	0.19	-2.0668	0

Table 7.3 indicates that the major long-term losers from such a tariff reduction policy, for either case, are the private capital stock and aggregate supply. Both decline by 0.4 per cent from their base levels. The major gainers from this policy are the trade balance and foreign asset stock, which increase by 0.19 and 1.67 per cent from their baselines respectively. Other developments suggest an appreciation of the real exchange rate by some 2 per cent, primarily due to a decrease of the nominal wage (not shown here), and no long-term effect upon the rate of inflation.

While these changes are indicative of the overall effects arising from such a policy, it is of interest to identify the adjustment process towards long run steady state. As can be seen from Figure 7.2, all the macro variables under consideration achieve their long run steady states at about the same time irrespective of whether there is a gradual or up-front process. However, the dynamics of adjustment over the short run and medium run are again different, although mainly in terms of magnitude and not in terms of the direction of adjustment. The tariff reduction leads to a decline in aggregate supply over the short run, with this being marginally pronounced with an up-front path. Deteriorations in production reflect a decrease in investment reflected in a decumulation of the private capital stock arising from an immediate decline in the market valuation of capital stock relative to its replacement value (the Tobin's q ratio). The long run sees a continual decline in the private

capital stock to the long run steady state, after levelling off in the medium run, being about 0.4 per cent lower from its baseline.

The foreign asset stock increases sharply in the first period of the short run as a result of current account surpluses arising from a tariff reduction and the strengthening of the real exchange rate, with this again being more pronounced under an up-front process. With both cases the foreign asset stock deteriorates gradually over the remainder of the short run, levelling off in the medium run period, then increases again to the long run steady state at about 1.7 per cent higher than its baseline. The factors contributing to the nominal foreign capital stock improvement is the appreciation of the real exchange rate, and developments in the trade balance⁶⁰.

The adjustment of the trade balance is very similar for either the gradual or up-front cases. An improvement is apparent on impact, as reflected by the increase in foreign asset stocks, with a different magnitude depending on the speed of tariff reduction; 0.5 per cent higher from baseline for the up-front case, and 0.3 per cent for the gradual case. For both cases, after improving on impact, the remainder of the short run sees a deterioration in the trade balance. By the end of the short run period, however, the trade balance has improved relative to baseline in the gradual process case, being marginally more pronounced than that of the up-front case. This is primarily due to the larger appreciation of the real exchange rate. In the long run steady state the trade balance is almost 0.2 per cent higher than baseline.

The real exchange rate appreciates continually throughout the short run for both cases, and depreciates slightly thereafter by the end of the medium run under the immediate tariff reduction case. However, the real exchange rate has still appreciated by 2 per cent from its baseline in the long run steady state for both cases. Finally, there is a tiny increase

⁶⁰ From Equation (16) in Chapter 5, it is assumed that $\dot{f} = 0$ and $\dot{e} = \dot{p} = 0$ in the long run steady state, so an increase in the foreign capital stock (f) and trade balance ($tx - tm$) must be offset by an appreciation (decline) of the real exchange rate ($e - p$) in order for this equation to go to zero. An increase (fall) in (f) indicates current account surpluses (deficits).

in inflation on impact for either case. Throughout the remainder of the adjustment process, inflation declines to steady state.

7.2.3 Simulation results arising from the privatisation of the SOE capital stock

It is assumed that in carrying out privatisation the capital of the publicly owned SOEs is simply given to the private sector, and that privatisation leads to an increase in the private capital stock. Two initial simulations are carried out in which privatisation is introduced at different speeds. In the first, an immediate process of privatisation occurs, while in the second gradual privatisation takes place over two years. To simulate immediate privatisation, it is assumed that 5 per cent of the SOE capital stock is given to the private sector on impact. Gradual privatisation will happen as follows: 3 per cent of SOE capital is given on impact, 1 per cent more for each of the next two years. The long run steady state properties of each macroeconomic variable of interest, in percentage deviation terms, from the initial baseline, are given in Table 7.4. Figure 7.3 contains the adjustment process involved in this scenario.

Table 7-4: Simulation Results: Privatisation of SOE Capital Stock (5 per cent)
% deviation from baseline

	Variables					
	f	k^p	y^s	t	c	p
Up-front privatisation						
Instantaneous impact	0	0	0	0.0093	0	-0.0127
Short run impact	-0.3295	2.9114	-1.2606	0.0642	-2.1263	-0.0173
Medium run impact	-2.7381	3.678	-0.7651	0.1318	-1.0415	-0.0051
Long run impact	-5.2191	5.0417	0.0417	0.0313	0.2087	0
Gradual privatisation						
Instantaneous impact	0	0	0	0.0056	0	-0.0076
Short run impact	-0.0534	2.2767	-1.0284	0.0604	-1.7099	-0.0058
Medium run impact	-2.5747	3.6037	-0.811	0.1325	-1.1291	-0.0065
Long run impact	-5.2191	5.0417	0.0417	0.0313	0.2087	0

As can be seen from Table 7.4, in the long run steady state the size of adjustment of the macro variables is the same for both the immediate and gradual processes. However, from Figure 7.3 the dynamics of adjustment is again different, although mainly in terms of

magnitude and not in the direction of adjustment. Again, starting with output adjustments, the following observations can be made. Initially aggregate supply decreases for either case, being more pronounced in the case of immediate privatisation, due to an increase in the real wage level arising from the nominal wage rate increasing by more than the price level. The medium run sees an increase in domestic production due to a fall in the real wage and a larger private capital stock arising from the shift of the SOE capital stock to the private sector. Domestic output is marginally larger in the immediate privatisation process. Although a more oscillatory adjustment of aggregate supply occurs in the up-front process, the long run steady state, in which output is a relatively negligible 0.04 per cent higher than its base level, is achieved at about the same time for both cases.

The adjustment process of the private capital stock is very different from that of aggregate supply in terms of direction. The 5 per cent of SOE capital stock given to the private sector has no impact effect on the change of the private capital stock. This is simply due to the underlying assumptions of the model. The private capital stock improves continually over the short run period, being some 2.9 per cent and 2.3 per cent higher than baseline, for the cases of the immediate and gradual process respectively, by the end of it. A gradual increase thereafter to the steady state over the medium and long run is apparent with either case. As in the previous tariff reduction shock case, the privatisation policy shock produces a similar adjustment of the private capital stock to the steady state under both the immediate and gradual privatisation processes. The steady state of the private capital stock is achieved at 5 per cent higher than its baseline.

As for external developments, after experiencing an increase in the first period of the short run, a fall in the foreign asset stock over the short and medium run periods is apparent, as a result of current account deficits and the strengthening of the real exchange rate. This is more pronounced with the up-front process. The foreign asset stock deteriorates continually throughout the long run period under either case, being some 5.2 per cent lower than baseline by the steady state, indicating continual current account deficits.

An increase of privatised assets from SOEs contributes to an improvement in the trade balance in both cases in the first period of the short run, partly due to aggregate demand (not shown here) being less than aggregate supply and an improvement of the foreign asset stock. This is more pronounced in the up-front case. However, the remainder of this period sees a slight deterioration in the trade balance. Over the medium term an improvement in the trade balance occurs again, which is favourably affected by the depreciation of the real exchange rate. With both the up-front and gradual processes the trade balance increases by approximately 0.13 per cent by the end of the medium run. The deterioration of the trade balance continues until the long run steady state, where the trade balance is only 0.03 per cent higher than its base level. The real exchange rate depreciates by 0.2 per cent from baseline for both cases.

Finally, inflationary developments are more turbulent initially in the up-front case. In this case, there is an initial decline in inflation, although it is fairly negligible in the gradual case. Inflation initially declines, resulting from aggregate demand decreasing more than aggregate supply. The second half of the short run period sees a small increase in inflation, due to the growth rate of aggregate supply being smaller than that of aggregate demand. A further decline in inflation is apparent in the medium run. After these initial divergences, the adjustment to the long run steady state is very similar irrespective of the process.

7.2.4 Simulation results arising from “Big Bang” and “Gradual” approaches under a fixed exchange rate

In this subsection two cases involving a multitude of policy instruments designed to illustrate the more complex cases of gradualism and shock approaches are considered. In both simulations, devaluation, tariff reduction and privatisation of the SOE capital stock are undertaken, the only difference being the speed with which these actions are taken. The “Big Bang” approach assumed here involves up-front devaluation (5 per cent), up-front tariff reduction (5 per cent) and the privatised capital stock is immediately given to the private sector (5 per cent). The gradual approach involves gradual devaluation, tariff

reduction and privatisation phased in the same manner as in the earlier simulations. Table 7.5 gives the long run steady state properties of each macroeconomic variable under consideration, in percentage deviation terms, from the initial baseline. The adjustment process involved in this scenario is contained in Figure 7.4.

**Table 7-5 Simulation Results: “Big Bang” Approach vs. “Gradual” Approach
under a fixed exchange rate**
% deviation from baseline

	Variables					
	f	k^p	y^s	t	c	p
“Big Bang” approach						
Instantaneous impact	0	0	0.5	1.5098	5	1.1509
Short run impact	3.1072	1.9989	-1.9954	0.2018	-4.9502	-0.0169
Medium run impact	-0.6124	3.0175	-1.3254	0.3386	-3.341	-0.0095
Long run impact	-3.549	4.6284	-0.3716	0.2213	-1.8581	0
Gradual approach						
Instantaneous impact	0	0	0.3	0.9059	3	0.6906
Short run impact	16.857	-4.2451	-4.8812	0.8267	-7.6287	0.4504
Medium run impact	6.2583	-0.6915	-3.5286	0.5907	-6.8286	-0.0256
Long run impact	-3.549	4.6284	-0.3716	0.2213	-1.8581	0

The implementation of a reform package, irrespective of whether it is a “Big Bang” or gradual approach, is felt instantaneously in four out of the six variables, namely aggregate supply, trade balance, real exchange rate and inflation, with their effects being larger for the “Big Bang” approach. Aggregate supply immediately rises, although as apparent from Figure 7.4 the magnitude involved is relatively small, resulting from a decline in the real wage level as the price level rises by more than the nominal wage (not shown here). The real exchange rate depreciates as a result of the devaluation of the nominal exchange rate, contributing positively to an improvement in the trade balance and foreign asset stock. Another factor contributing to the development of the trade balance is aggregate demand (not shown here) being less than aggregate supply.

The impact effects gradually impinge upon developments in all the markets, as the adjustment process moves into the short run. The short run period sees an initial sharp fall in aggregate supply for either approach, this being less pronounced with the “Big Bang”

approach due to increasing investment as reflected in a higher private capital stock. Although there is a rise in the capital stock given to the private sector due to the implementation of the privatisation policy for the gradual approach, the transfer of state owned capital stock to the private sector is offset by adverse developments on the existing stock in this sector arising from an increase in the interest rate (not shown here). This leads to a decumulation in private capital stock. The decumulation contributes to a continual decline in aggregate supply over the short run, with this being more pronounced than for the “Big Bang” approach. By the end of the short run the private capital stock is about 2 per cent higher than its base level with the “Big Bang” approach but 4.3 per cent lower from the baseline with the gradual case, while domestic production is at a level lower than its baseline for both cases. External developments in the short run suggest a similar development in the trade balance under either approach due to a depreciation in the real exchange rate and a gradual rise in foreign asset stocks as a result of current account surpluses. The adjustment process of these variables is similar in direction but different in magnitude. By the end of the short run the trade balance deteriorates, the real exchange rate appreciates by almost 5 per cent and 7.6 per cent for the immediate and gradual approaches respectively, the foreign asset stock improves with this being most pronounced under the gradual approach. The effect of the nominal exchange rate devaluation leads to a spike in inflation, with it being 1.2 per cent higher than its baseline.

Over the medium run aggregate supply reverses its decline, although it is still under its base level by the end of this period, resulting from an increasing private capital stock, which continues rising with the “Big Bang” approach and starts rising after bottoming out with the gradual approach. This period is characterised by a gradual decline in inflation which achieves its steady state by the end of it. Little difference is apparent under either system over the medium and long runs thereafter. In terms of external developments, some noticeable differences are again apparent. The real exchange rate appreciates continually by some 10 per cent at the end of the first half of the first year of this period under the gradual approach, while a slight depreciation in the real exchange rate occurs in the shock therapy

approach over the period. An appreciation in the real exchange rate, and resulting deterioration in international competitiveness, contributes to a deterioration in the trade balance for both cases. With the gradual approach the foreign asset stock, after reaching its peak at 16.9 per cent higher from its baseline at the end of the short run period, declines over this period. This deterioration also happens under the “Big Bang” approach.

Over the long run, until the steady state, aggregate supply and the private capital stock increase continuously for both cases. However, aggregate supply achieves its long run steady state at about 0.4 per cent lower than its baseline, while for the private capital stock this figure is 4.6 per cent higher than its baseline. The privatisation of the SOE capital stock stimulates private investment, and when in place further stimulates aggregate supply. The structural shift in the economy – from state to private – does not, therefore, appear to benefit domestic production. Additional demand from investment is also enhanced by additional demand from private consumption spending, due to the rise in private sector wealth. External developments are characterised by a continual depreciation of the real exchange rate and improved trade balance, and a continual deterioration in the foreign asset stock. The latter being about 3.6 per cent lower than its base level and indicating current account deficits. A prolonged adjustment to the long run steady state over the long run period is apparent with the gradual approach, while the steady state is achieved relatively quickly with the “Big Bang” approach.

7.2.5 Simulation results arising from “Big Bang” and “Gradual” approaches under a flexible exchange rate

This subsection investigates the effects of a tariff reduction and privatisation of SOE capital stock at different speeds with the assumption of the Vietnamese economy operating under a flexible exchange rate regime, which is different from the previous subsection where a fixed exchange rate applied. The presumed changes in tariffs and privatised SOE capital stock given to the private sector, and their speeds, are phased in the same manner as in the earlier simulation. The long run steady state properties of each macroeconomic

variable of interest, in percentage deviation terms, from the initial baseline, are represented in Table 7.6. The adjustment process is contained in Figure 7.5.

Table 7-6: Simulation Results: “Big Bang” Approach vs. “Gradual” Approach under a Flexible Exchange Rate
% deviation from baseline

	Variables					
	f	k^p	y^s	t	c	p
“Big Bang” approach						
Instantaneous impact	0	0	-0.0595	0.362	-0.5949	-0.3618
Short run impact	0.6874	2.8996	-1.4048	0.2758	-3.5478	0.0602
Medium run impact	-1.4034	3.4764	-1.0597	0.2923	-2.9796	-0.0047
Long run impact	-3.5492	4.6284	-0.3716	0.2213	-1.858	0
Gradual approach						
Instantaneous impact	0	0	-0.0357	0.2172	-0.357	-0.2171
Short run impact	0.1023	2.6405	-0.956	0.2402	-2.8045	0.0065
Medium run impact	-1.6051	3.6119	-0.9788	0.2814	-2.848	-0.0008
Long run impact	-3.5492	4.6284	-0.3716	0.2213	-1.858	0

As can be observed from Table 7.6, there is no difference in the long run steady state results between the “Big Bang” and gradual approaches. More interesting, Table 7.6 also indicates that the long run steady state adjustment of the macrovariables from their base levels will be the same for either version of the exchange rate. There is no effect upon the inflation rate in the long run steady state because there is no monetary accommodation in the long run equilibrium. The dynamic adjustment process, however, indicates a difference in terms of magnitude rather than direction of adjustment of the key macroeconomic variables of interest. It is also noticeable that, with a fixed exchange rate, irrespective of the approaches involved, the adjustment of the six key macroeconomic variables focused upon is more oscillatory in the short and medium run periods in comparison with that under a flexible exchange rate. This is most apparent for the case of an increase in the domestic price level or inflation due to the effect of the devaluation of the nominal exchange rate.

Under a flexible exchange rate, domestic developments suggest an initial decline in aggregate supply for both “Big Bang” and gradual approaches on impact, due to an increase in the real wage level (not shown here), as the nominal wage rises by more than

the price level. An improvement in the trade balance on impact, with this being more pronounced with the “Big Bang” approach, is primarily due to the growth rate of aggregate demand being bigger than that of aggregate supply. In asset markets the nominal exchange rate appreciates, contributing to a slight decline in the nominal interest rate so as to maintain the uncovered interest rate parity condition. As a result an appreciation of the real exchange rate is apparent, by some 0.6 per cent and 0.4 per cent with the “Big Bang” and gradual approaches respectively. Inflation declines on impact for either case; however, its initial decline is more pronounced with the “Big Bang” approach.

During the short run period the increase in the privatised SOE capital stock given to the private sector has a positive effect on private sector investment, with a resulting gradual accumulation of the private capital stock. Aggregate supply continues declining throughout the short run period due to the increasing real wage. This decline is most noticeable with the “Big Bang” approach. In terms of external developments the real exchange rate further appreciates for both cases, by 3.6 per cent with the “Big Bang” approach and 2.8 per cent with the gradual approach by the end of the short run period, causing a deterioration in foreign asset stocks and the trade balance. This deterioration is larger from its baseline for the shock therapy case. This period is characterised by increasing inflation as aggregate demand increases by more than aggregate supply.

Over the medium run a further increase in the private capital stock favourably affects aggregate supply, contributing to a further rise, but it is still lower than the initial baseline for both cases by the end of this period. Declining inflation is apparent as aggregate supply starts its recovery. As for external developments the major change relates to a depreciation of the real exchange rate, although it has still appreciated relative to the baseline, with a resulting improvement in international competitiveness, which contributes to an improvement in the trade balance for either case. During this period, however, foreign asset stocks decline, indicating overall current account deficits.

Over the long run a continual improvement in the private capital stock is apparent, stimulating aggregate supply. Although these two variables increase to the long run steady

state, aggregate supply still stands at around 0.4 per cent lower from its initial baseline. Inflation declines gradually to steady state where it has returned to its base level, due to aggregate demand catching up with aggregate supply. External developments are characterised by a continual depreciation of the real exchange rate and improved trade balance, while real foreign asset stocks achieve their steady state at some 3.5 percentage points lower than the base level.

7.2.6 A comparison the “Big Bang” and gradual approaches between two versions of the exchange rate

A comparison between the two exchange rate regimes, fixed and flexible, in which the reform package is implemented immediately and gradually is represented in Figure 7.6. From this figure in long run steady state the size of adjustment of the macro variables is the same for both versions. However the dynamics of adjustment is again different, although mainly in terms of magnitude and not in the direction of adjustment. Aggregate supply increases slightly on impact under the fixed exchange rate system, while for the flexible exchange rate version there is a relatively negligible decline. Over the short run, developments in domestic production are similar under either system, with a gradual decline apparent. The medium run sees an increase for both approaches under a flexible exchange rate while under a fixed exchange rate aggregate supply continues to decline, bottoming out at 5 per cent lower than its baseline for the gradual case. There is a gradual increase to the long run steady state for both versions of the exchange rate, and this is achieved relatively quickly with a flexible exchange rate.

Over the short run period the private capital stock shows a similar adjustment process for both approaches under a flexible exchange rate and the “Big Bang” approach under a fixed exchange rate. A gradual increase is apparent until the end of the short run period under a flexible exchange rate and the “Big Bang” approach under a fixed exchange rate, this being most pronounced with the “Big Bang” approach under a flexible exchange rate. With the gradual approach under a fixed exchange rate a fall of 4.2 per cent occurs by the

end of this period. Thereafter, over the medium run, this trend is reversed in the latter case although the private capital stock is still under its base level by the end of this period. A prolonged adjustment to the long run steady state over the long run is apparent with a fixed exchange rate, particularly so in the gradual case, while the steady state is achieved relatively quickly with a flexible exchange rate.

The foreign asset stock improves substantially in the short run for the gradual approach under a fixed exchange rate, being some 17 per cent higher than baseline by the end of it, while an improvement in the foreign asset stock is small under the case of a flexible exchange rate. Throughout the medium run period a deterioration in this variable is apparent for both approaches under either version. However, the gradual approach in the fixed exchange rate case appears to be better in terms of higher foreign asset stocks. This could be important if foreign exchange reserves in the economy are low. The long run steady state is reached at about 3.5 per cent lower than the baseline, indicating current account deficits.

The development in the trade balance is very similar irrespective of the exchange rate mechanism in operation. It improves on impact, with this being most pronounced with the “Big Bang” approach under a fixed exchange rate. Over the short and medium runs, it stabilises with a flexible exchange rate, but deteriorates further with a fixed exchange rate. Over the long run the steady state is achieved quite rapidly with a flexible exchange rate, but greater volatility is apparent with a fixed exchange rate, being 0.2 per cent higher than its baseline.

The real exchange rate depreciates on impact under a fixed exchange rate due to the effect of the nominal exchange rate devaluation, while it appreciates under a flexible exchange rate. By the end of the short run the real exchange rate has appreciated in all cases. This appreciation is most noticeable with the gradual approach under a fixed exchange rate over the short and, particularly, medium run periods. A gradual depreciation is apparent over the medium and long runs under both versions of the exchange rate system. The prolonged and oscillatory nature of adjustment of the real exchange rate, under

a fixed exchange rate, contributes to the more oscillatory adjustment of the trade balance and aggregate supply itself.

7.2.7 Simulation results arising from a temporary change in public capital expenditure⁶¹

During the transition process from a centrally planned economy to a market one the Vietnamese government has applied a fiscal expansion policy, focusing on increasing capital expenditure in order to restructure the economy. Concern with the effect of this development on domestic output, private investment behaviour, and trade performance, combined with the reform policies undertaken, is very important for policy-makers. Thus the simulation conducted in this subsection examines the effects of a change in public capital expenditure, combined with the gradual reform package introduced previously, on the economy of Vietnam under both exchange rate versions of the model. The pattern of the temporary shock in public spending is represented along with the change in tariffs, nominal exchange rate (for the fixed exchange rate case) and privatisation of the SOE capital stock in Table 7.7. The presumed change in public investment spending is that of a 3 per cent increase from its baseline on impact, 1 per cent more in the next period, then 3 per cent increase from its baseline is maintained during the remainder of the adjustment process. Table 7.8 summarises the long run steady state properties of each variable under consideration, in percentage deviation terms, from its initial baseline. The dynamic adjustment process is given in Figure 7.7.

⁶¹ This simulation is conducted for the gradual case only.

Table 7-7: Pattern of Temporary Change in Public Capital Expenditure Combined with the Reform Package

The pattern of shock: public capital expenditure	0	3	4	3
The pattern of shock: tariff reduction	0	-3	-4	-5
The pattern of shock: devaluation*	0	3	4	5
The pattern of shock: privatisation	0	-3	-4	-5
Transition times for such shocks	0	0*	1	2

* devaluation is applied for the fixed exchange rate version only.

Table 7-8: Simulation Results: Temporary Change in Public Capital Expenditure Combined with the Reform Package
% deviation from baseline

	Variables					
	f	k^p	y^s	t	c	p
Under a fixed exchange rate						
Instantaneous impact	0	0	0.3	0.8375	3	0.7737
Short run impact	11.5068	-2.5399	-3.4463	0.652	-5.8034	0.3639
Medium run impact	-2.2899	3.0145	-0.9963	0.3041	-3.0361	-0.0409
Long run impact	-20.2086	12.8015	4.8016	-0.3987	6.0082	0
Under a flexible exchange rate						
Instantaneous impact	0	0	-0.0664	0.0855	-0.6634	-0.1964
Short run impact	-5.5607	4.4604	0.5474	0.0621	-0.8673	-0.0822
Medium run impact	-11.4897	7.9885	1.9267	-0.0895	1.3241	-0.0358
Long run impact	-20.209	12.8018	4.8017	-0.3987	6.0085	0

Table 7.8 indicates that the major long term benefits from such an expansion in fiscal policy, combined with a reform package, are the same for both versions of the model in regard to an increase in the private capital stock, which increases by 12.8 per cent from its base level. This is much higher than the level where only a reform package occurs, indicating a net crowding in effect. An increase in aggregate supply also occurs (which increases by 4.8 per cent from its base level), as does the real exchange rate (which depreciates by approximately 6 per cent from its base line). The major loser from such a policy expansion is that of foreign asset stocks, which decline some 20 per cent from base level. Other developments suggest a deterioration in the trade balance by some 0.4 per cent. There is no long-term effect upon the rate of inflation under both versions of the exchange rate regime.

The dynamics of adjustment is again different between the two versions of the model in terms of magnitude but not in terms of the direction of adjustment. The announcement of the policy change is felt instantaneously in asset markets where the q ratio, the nominal interest rate (not shown here) and real exchange rate are the relevant variables. The q ratio immediately rises in line with a rise in equity prices, thereby increasing the market valuation of capital stock relative to its replacement value. The devaluation of the nominal exchange rate in the case of a fixed exchange rate results in a depreciation in the real exchange rate, while it appreciates marginally with the flexible exchange rate case. The expectation of a further appreciation of the nominal exchange rate is created, contributing to a decline in the nominal interest rate so as to maintain the uncovered interest rate parity condition.

The impact effects gradually impinge upon developments in the product market, as the adjustment process moves into the short run. The increase in public capital expenditure contributes to an increase in real profit under a flexible exchange rate. The real profit increase contributes to an increase in the q ratio and a stimulation of investment and accumulation of private capital stock. Aggregate supply is increased directly and indirectly from this spending. The increased public stock of capital enhances output directly, but it also increases real profit on capital services and therefore private investment and thereby affecting supply indirectly. However, under the fixed exchange rate case a deterioration in the private capital stock and in aggregate supply occurs, mainly due to a decrease in the q ratio and an increase in the real wage. External developments during the short run see an opposite direction of adjustment under both versions of the exchange rate regimes for the variables including foreign asset stock, trade balance and real exchange rate. Initially the real exchange rate depreciates in the fixed exchange rate regime but appreciates in the other case, although in both cases this is quickly reversed. Developments in the real exchange rate exert the major influence over the trade balance. The improvement in the trade balance is most noticeable under a fixed exchange rate, primarily due to the larger depreciation of the real exchange rate. Developments in the foreign asset stock, reflecting developments in

the current account, arise from those taking place in the trade balance and real exchange rate. With a fixed exchange rate the current account improves initially, as reflected by the increase in foreign asset stocks. With a flexible exchange rate, however, foreign asset stocks decline, indicating a current account deficit.

Over the medium run, a further increase in the private capital stock stimulates the development of aggregate supply with a flexible exchange rate, while the case of a fixed exchange rate sees the upward trend of both these variables after bottoming out at about 3 per cent lower from their baselines. With a fixed exchange rate inflation picks up at 0.8 per cent in the short run and declines thereafter to the baseline in steady state by the end of the medium run period. The inflationary effects are negligible under a flexible exchange rate. In terms of external developments, a continual appreciation of the real exchange rate with the fixed exchange rate case contributes to a deterioration in the trade balance, while an improvement in the trade balance under the flexible exchange rate case is attributable to the depreciation of the real exchange rate. With a fixed exchange rate, foreign asset stocks start to decline after peaking at 11.5 per cent higher than baseline throughout this period. A continual deterioration in foreign asset stocks is apparent with a flexible exchange rate.

Over the long run to ultimate steady state an increase in public capital spending and privatised SOE capital stock stimulate private sector investment, while the capital stock, when in place, further simulates aggregate supply. The steady states of these two variables are achieved at higher levels from their initial baselines for both cases. External developments are characterised by a depreciation in the real exchange rate, a deterioration in the trade balance, which decreases by some 0.4 per cent lower than its baseline for either case. In addition, foreign asset stocks are still on the downward trend, indicating current account deficits. A prolonged adjustment to the long run steady state over the long run is apparent with a fixed exchange rate, while the steady state is achieved relatively quickly with a flexible exchange rate.

A comparison between this simulation scenario and the previous ones, in which a reform package at different speeds has been applied alone, suggests that public capital

spending can ‘crowd in’ private investment and lead to an improved performance for a number of key macroeconomic variables. Asset market variables have a key role to play in the process of transmitting the effects of such a change in policy to the macroeconomy. As is clear from the simulation results, public capital spending directly enhances the supply capacity of the economy as well as aggregate supply. It also indirectly enhances aggregate supply, on balance, through its improvement of the real private capital stock. Finally, developments in the external sector are somewhat mixed. In the context of a transition economy such as Vietnam, which has a major problem on current account, an expansion in public capital spending could exacerbate difficulties on the current account, as indicated by declining foreign asset stocks. However, the trade balance can be improved as a result of a weakening of the real exchange rate during the adjustment process.

7.3 Policy Implications

The results of the simulations illustrate the complexities of the issues involved in transition economies such as Vietnam in regards to the speed of adjustment or sequencing of reforms. Much depends on the objectives being sought, the time frame, and the sustainability of the macroeconomic situation. The major findings and policy implications derived from the simulation analysis in each case can be summarised as follows:

1. For the scenario of a nominal exchange rate devaluation under a fixed exchange rate, the main findings from the simulation results suggest that this has advantages and disadvantages. The devaluation of the nominal exchange rate leads to a depreciation in the real exchange rate in the short run, contributing to an improvement of competitiveness and a better performance externally – trade and current accounts. However, it has the disadvantage of maintaining a lower value for the q ratio which has an adverse impact on investment, private capital stock and aggregate supply as well. The biggest problem appears to be over the medium to long run where the real exchange rate appreciates, the trade balance eventually deteriorates bringing down the foreign asset stocks.

A shock therapy approach to devaluation is preferable to a gradual approach for minimising the deterioration of the private capital stock, aggregate supply, and international competitiveness. However, under the gradual devaluation there is more of an improvement in the external current account and trade balance through the medium and long run periods.

2. With the fixed exchange rate assumed, for the scenario of a tariff reduction, as committed to by the Vietnamese government when it joined AFTA, signed the bilateral trade agreement with the US, and as a likely prerequisite for it becoming a member of WTO in the next few years, the simulation results indicate that the private capital stock and aggregate supply are unfavourably affected by the tariff reduction irrespective of whether the change is up-front or partial. The tariff reduction leads to a decumulation in the private capital stock resulting from a higher nominal interest rate and a decrease in Tobin's q ratio, which is a main factor contributing to the decreasing aggregate supply in the long run steady state. The implementation of a tariff reduction results in an improvement of current account outcomes over the adjustment period, primarily due to the strengthening of the real exchange rate.

These findings suggest that in the long run steady state there will be no difference in the effect upon the macroeconomic variables irrespective of whether an up-front or gradual tariff reduction has been applied. However, for the short run period, if maximising the foreign asset stocks and trade balance and minimising the decline of aggregate supply and the private capital stock are the primary considerations, an up-front tariff reduction would have to be pursued. But over the medium run this approach may hurt the economy in regards to external developments including foreign asset stocks, trade balance and real exchange rate. As far as the developments of these variables are concerned, the gradual tariff reduction is a suggested policy to be pursued. Tariffs, and the number of tariff rates, should continue to be reduced to promote the shift to a more open economy and reduce the

scope for trade diversion under AFTA⁶². Trade reforms need to be supported by a broad range of complementary policies to maximise their benefits and reduce any adjustment costs. Domestic liberalisation and policies to develop the domestic and foreign invested private sector are crucial, as are SOE and banking reforms. Export expansion is also a key complementary policy to support the trade liberalisation policy, as it can lead to an improvement of the current account.

3. The implications of an increase in the capital of public state-owned enterprises transferred to the private sector (privatisation policy) under the fixed exchange rate system is a possible increase in private investment and private wealth (financial market), and result in a large impact on real economic activity. This is due to the interdependence between financial and product markets. The domestic financial market, which tends to adjust instantaneously, will transmit the impact of such shocks to the real sector of the economy through changes in key variables in the financial sector such as the interest rate, nominal and real exchange rate, q ratio, and wealth effect on investment.

The results indicate that as the SOE capital stock is privatised, a corresponding increase occurs in the rate of private investment and private wealth as the residents hold the shares of the privatised companies. The resulting higher private capital stock causes aggregate supply to rise. The results show that the development in the trade balance, in particular during the short and medium run periods, reflects a decline in aggregate demand. The depreciation in the real exchange rate thereafter also contributes to an improvement in the trade balance, despite a deterioration of foreign asset stocks, as a result of current account deficits.

The other implication is that, if maximising the private capital stock, foreign capital stock and trade balance are the primary considerations in the short run period, immediate privatisation would have to be pursued – although it should be emphasised, and apparent from Figure 7.3, that the differences of magnitudes involved between the two approaches

⁶² AFTA calls for regional tariffs of 0-5 per cent across the board by 2006, except for a small exclusion list, and the liberalisation of non-tariff barriers on such goods.

are relatively small. It appears that the simulation results presented do not support the strategy of gradual privatisation as currently pursued by the Vietnamese government. However, if minimising the deterioration of domestic production and strengthening international competition are the only considerations, then privatisation introduced gradually becomes the “best” approach. A policy option to improve the performance and the efficiency of the enterprise sector, but to mitigate the negative social effects resulting from the increasing lay-offs arising from the privatisation of SOEs, is to increase steadily the pace of the privatisation process. Promotion of private sector development is a positive step that has to be taken in order for the privatisation of SOEs to be fully effective.

4. In looking at the complete policy package including devaluation, tariff reduction and privatisation of SOE capital stocks under the regime of a fixed exchange rate, for the short and medium periods, the “Big Bang” approach is better in terms of a smaller deterioration in domestic production, a smaller appreciation in the real exchange rate, and a more pronounced improvement in the private capital stock. However, the development of the real foreign asset stocks is more pronounced and there is a more oscillatory adjustment of the trade balance under the gradual approach for these periods.

Based on these simulation results, it is difficult to draw any major sequencing recommendations. The model and the simulations illustrate how difficult it is to tackle some real world sequencing considerations such as those discussed in Chapter 2. With concerns about the speeds and sequencing, the following points can be advanced.

First, a piece-meal approach to reform may not only fail to improve domestic production and the private capital stock significantly, but may reduce them during several initial periods. Consider, in the case of the simulations, a gradual approach to devaluation. It improves marginally the aggregate supply only on impact but leads to a sharp deterioration in aggregate supply over the short and medium run, resulting from the decrease in private capital stocks.

Second, careful sequencing can improve domestic production, but improper sequencing can harm it. A reduction in tariffs alone may lead to a deterioration in domestic

production and investment, while the privatisation policy alone helps improve these variables. The speeds at which the reform policies are undertaken also lead to different results in the adjustment process. For the tariff reduction policy, in the medium run period, the deteriorations of the domestic capital stock are smaller if the tariff is reduced immediately. An immediate privatisation alone helps improve the foreign asset stocks and trade balance more than a gradual one only in the short run period. However, when combining three policies of tariff reduction, nominal exchange rate devaluation, and privatisation of the SOE capital stock, a shock approach is better than a gradual approach if improving domestic production and the private capital stock are the primary considerations in the medium and long runs.

Third, in sequencing, just like speed, the criterion of improving the current account position over a number of periods can produce different results. For example, in the simulations, privatisation alone results in a deterioration in foreign asset stocks, indicating current account deficits, but improves the private capital stock and the trade balance in the long run steady state. If domestic production is ignored, and improvements in the external account are the only consideration, then a tariff reduction alone becomes a preferable policy. Also, a gradual approach to the reform package may produce an improvement in the foreign asset stocks in several initial years in the short and medium run periods.

5. If it is assumed that Vietnam applies a flexible exchange rate in combination with perfect capital mobility in the transition process to a market economy, the implications of the reform package including tariff reduction and privatisation can result in a positive impact on real economic activities. A gradual and immediate approach can lead to an improvement in the private capital stock, aggregate supply and the trade balance in the long run steady state. However, it results in an appreciation in the real exchange rate. Under this exchange rate system, a divergence in the adjustment of the key macroeconomic variables of interest is apparent only over the short and medium runs. Although experiencing the same benefits as those from the fixed exchange rate regime in the long run steady state, with a flexible exchange rate the gradual approach is somewhat better than its alternative as

a less oscillatory adjustment of aggregate supply and trade balance is apparent during these periods in time.

A comparison between the two versions of the exchange rate, in which the reform package is applied, suggests that if a primary objective of policy is to produce a better outcome in terms of domestic production, private capital stock, and the real exchange rate, the gradual approach under a flexible exchange rate is the preferred one. In view of the multitude of factors involved, however, it may remain inconclusive, reflecting the complexities of the issues involved.

6. The results derived from the simulations indicate that a policy of fiscal expansion, combined with a reform package, could lead to an overall “crowding in” effect of private investment, and an increase in the productive capital stock. This would have a positive effect upon the long run productive potential of the economy. A policy of fiscal restraint, on the other hand, which focuses upon reducing public capital spending, could have potentially adverse effects upon the economy’s infrastructure and impede future economic performance based on these results.

One implication of the approach taken here is that a policy of fiscal expansion combined with tariff reduction, privatisation of SOE capital stock and nominal exchange rate devaluation under a fixed exchange rate can lead to a temporary economic contraction, in particular during the short and medium runs, reflecting the large capital losses and hence wealth experienced by residents. With a fixed exchange rate this policy may produce an improvement in the trade balance and a depreciation in the real exchange rate on impact and the short run, the medium run sees a deterioration in the trade balance and foreign asset stocks resulting from a sharp appreciation in the real exchange rate. A depreciation in the real exchange rate, resulting in improved international competitiveness, is apparent in the same period with a flexible exchange rate.

The other implication is that such an expansionary fiscal policy, combined with a reform package, under a fixed exchange rate can improve foreign asset stocks during the short and medium runs, reflecting a current account surplus, primarily due to the

depreciation of the real exchange rate. However, the deterioration is apparent for either case in the long run steady state. Again, the transition to the long run steady state is more prolonged under a fixed exchange rate.

7.4 Conclusions

This chapter utilised a dynamic rational expectations macroeconomic model, emphasising the long run, to analyse the adjustment processes arising from a variety of shocks emanating from the transition process from a centrally planned economy to a market economy for Vietnam since 1986 when the *Doi Moi* policy was applied. The impact of such shocks was assumed to be felt first in financial markets, resulting thereafter in product and labour market adjustments.

The size and generality of the theoretical framework prevents the mathematical derivation of analytically unambiguous results, for both the steady state and dynamic properties of the model. However, this difficulty can be overcome through the use of a numerical simulation procedure through the assignment of numerical values to the parameters of the model. The simulation analysis focused upon important aspects of the sequencing and speed of the reform process in Vietnam: namely the impact of a nominal exchange rate devaluation, tariff reduction and privatisation of SOE capital stocks at different speeds, gradual or up-front, on the Vietnamese economy. A multitude of policy instruments designed to illustrate the more complex cases of gradualism and shock approaches, in which tariff reduction, devaluation and privatisation were undertaken at different speeds, was conducted in order to find out the answers to the questions of speed of adjustment and sequencing of reform for the economic transition process in Vietnam. Finally, a simulation was conducted with the aim of analysing the impact of a fiscal expansion policy change, combined with a reform package, under a fixed and flexible exchange rate regime on the economy of Vietnam.

It was apparent from the results derived that different reform policies can have different effects upon the Vietnamese economy. The nominal exchange rate devaluation

leads to a jump depreciation of the real exchange rate on impact, and a sudden improvement of international competitiveness. However, the major loser from such a policy is a decrease in the private capital stock that contributes to a deterioration in domestic production. The major conclusion is that if external developments are of lesser importance and improvements in aggregate supply and private capital stock are the only considerations, then only privatisation of SOE capital stocks becomes the preferred policy.

The outcomes in the simulations of the reform policies suggest that, under a fixed exchange rate, the “Big Bang” and gradual approaches for the policies of a tariff reduction and privatisation of SOE capital stock impart a less oscillatory adjustment of the variables under consideration over the adjustment periods than those for the devaluation policy. Up-front devaluation is preferable if minimising the decline of aggregate supply and private capital stock over the simulation periods are the primary considerations. Over the short and medium run periods, if improvements in the external current account and the trade balance are the only consideration, a gradual devaluation becomes the best approach. When these three policies are taken at the same time, however, the “Big Bang” approach is the “best” approach for the macroeconomic variables under consideration except for foreign asset stocks, which can have a benefit only from the reform package if done gradually over a specific period of time.

For a complete reform policy package, if looking at the alternative version, a floating exchange rate and liberalising capital controls, the gradual approach is somewhat better than the “Big Bang” approach in regard to the level of the increase of domestic production, private investment and international competition over the short and medium run periods. If the comparison is undertaken between the two versions, fixed and flexible exchange rate, the conclusion is that the reform package introduced gradually in the flexible exchange rate mechanism can produce a better result in terms of macroeconomic developments. This conclusion does support the economic strategy followed by the Vietnamese government currently regarding privatisation and tariff reduction policies, but it will require the government to change the exchange rate system from a fixed to a flexible one. Capital

account liberalisation will also be desirable for Vietnam on its way towards a market-oriented economy. However, the experiences of the financial crisis from the Asian countries during the period 1997-1998 shows that it is necessary to improve the way in which the domestic financial system allocates capital within the Vietnamese economy. Instead of encouraging short term flows in financing non-productive investment, which may generate an excessive aggregate demand and over-consumption in the private sector, promoting long term flows such as foreign direct investment in financing productive investment will be required in order to enhance the productive capacity of output supply.

A policy of a temporary increase in public capital spending combined with a reform package could have potentially favourable effects upon the development of the Vietnamese economy. These effects are different over the adjustment periods, but not in the long run steady state, whether these policies are conducted under a fixed or a flexible exchange rate. An expansionary fiscal policy, combined with a reform package, with a flexible exchange rate leads to more pronounced developments in domestic production, private investment and capital stock, and to a depreciation in the real exchange rate in the short and medium runs compared to that under a fixed exchange rate. The benefits from this policy under a fixed exchange rate is the improvement of the trade balance and foreign asset stocks, indicating current account surpluses in the short and medium runs. The conclusions derived from the simulations is that a flexible exchange rate, combined with perfect capital mobility, appears to be most appropriate for the economy of Vietnam when some reform policies are undertaken simultaneously.

Figure 7-1: Nominal Exchange Rate Devaluation

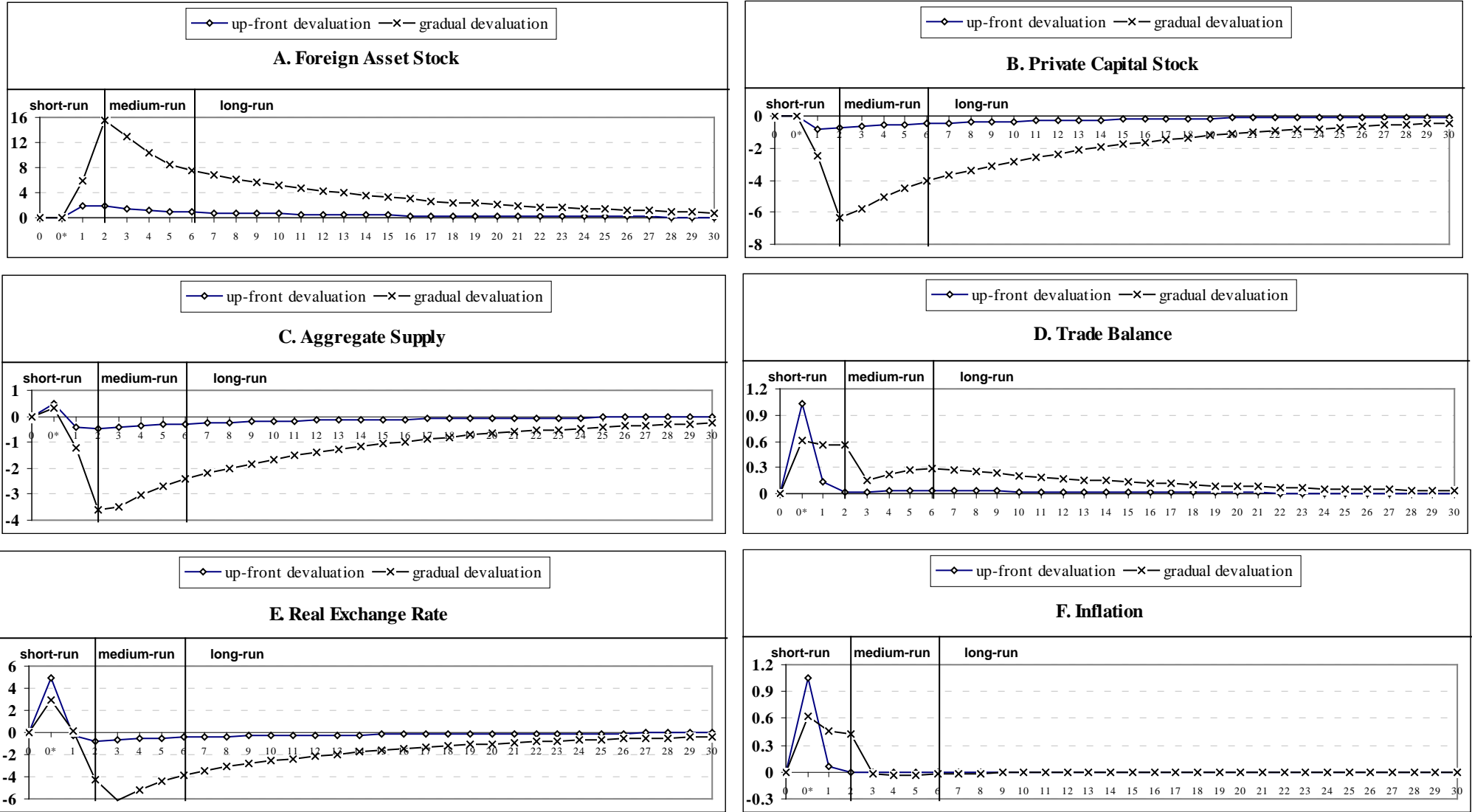


Figure 7-2: Tariff Reduction

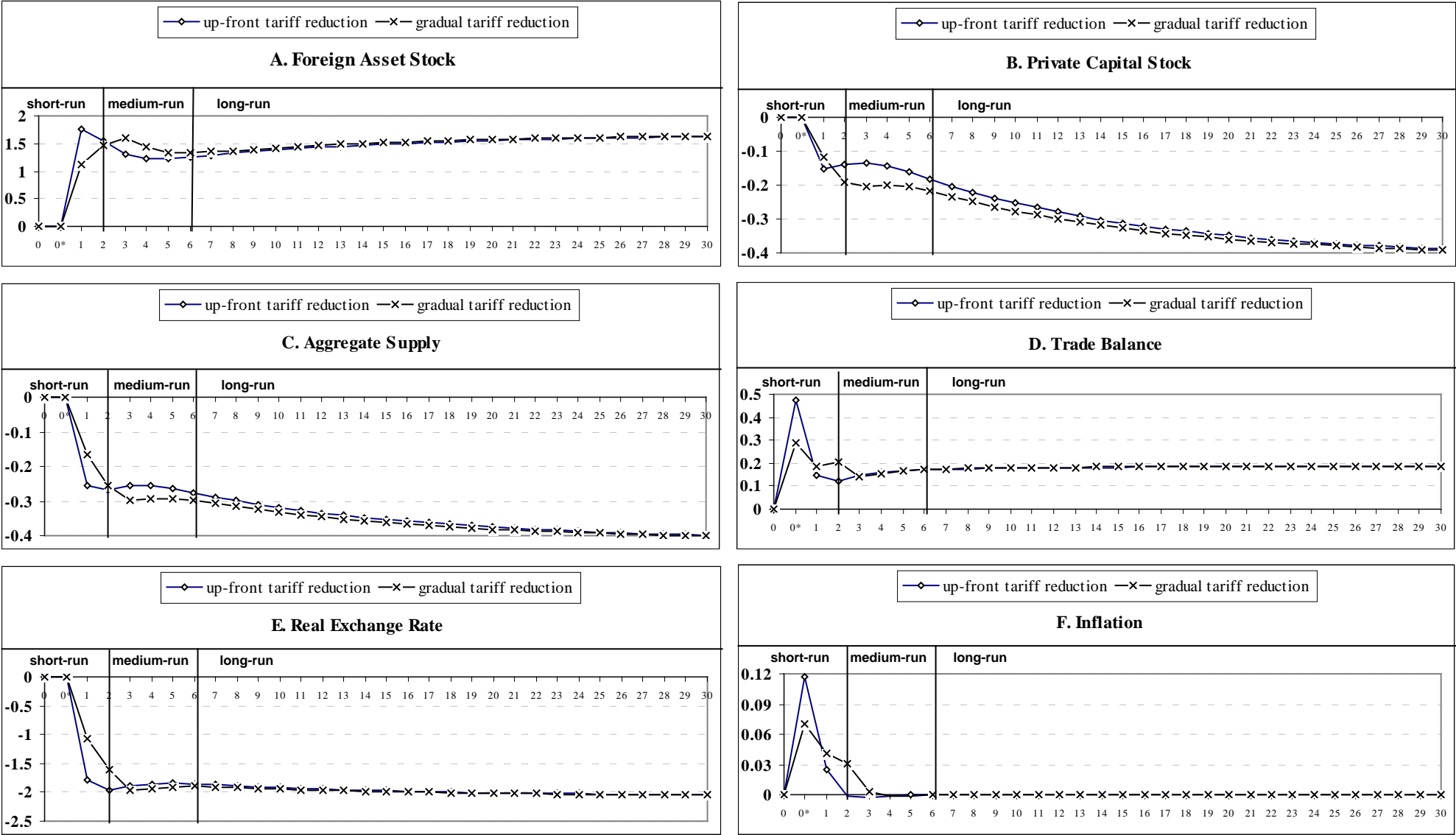


Figure 7-3: Privatisation of SOE Capital Stock

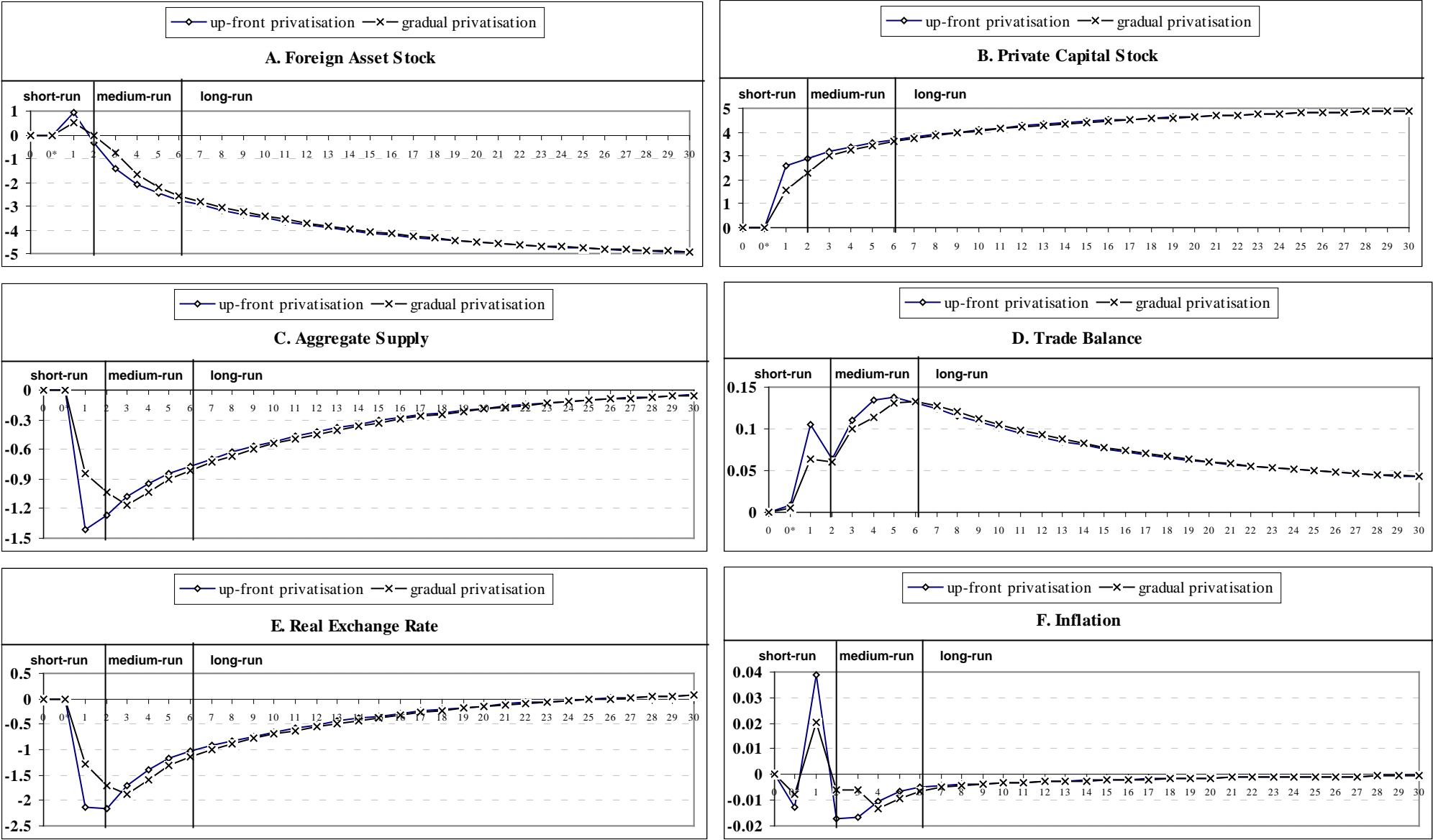


Figure 7-4: “Big Bang” Approach versus Gradual Approach under a Fixed Exchange Rate

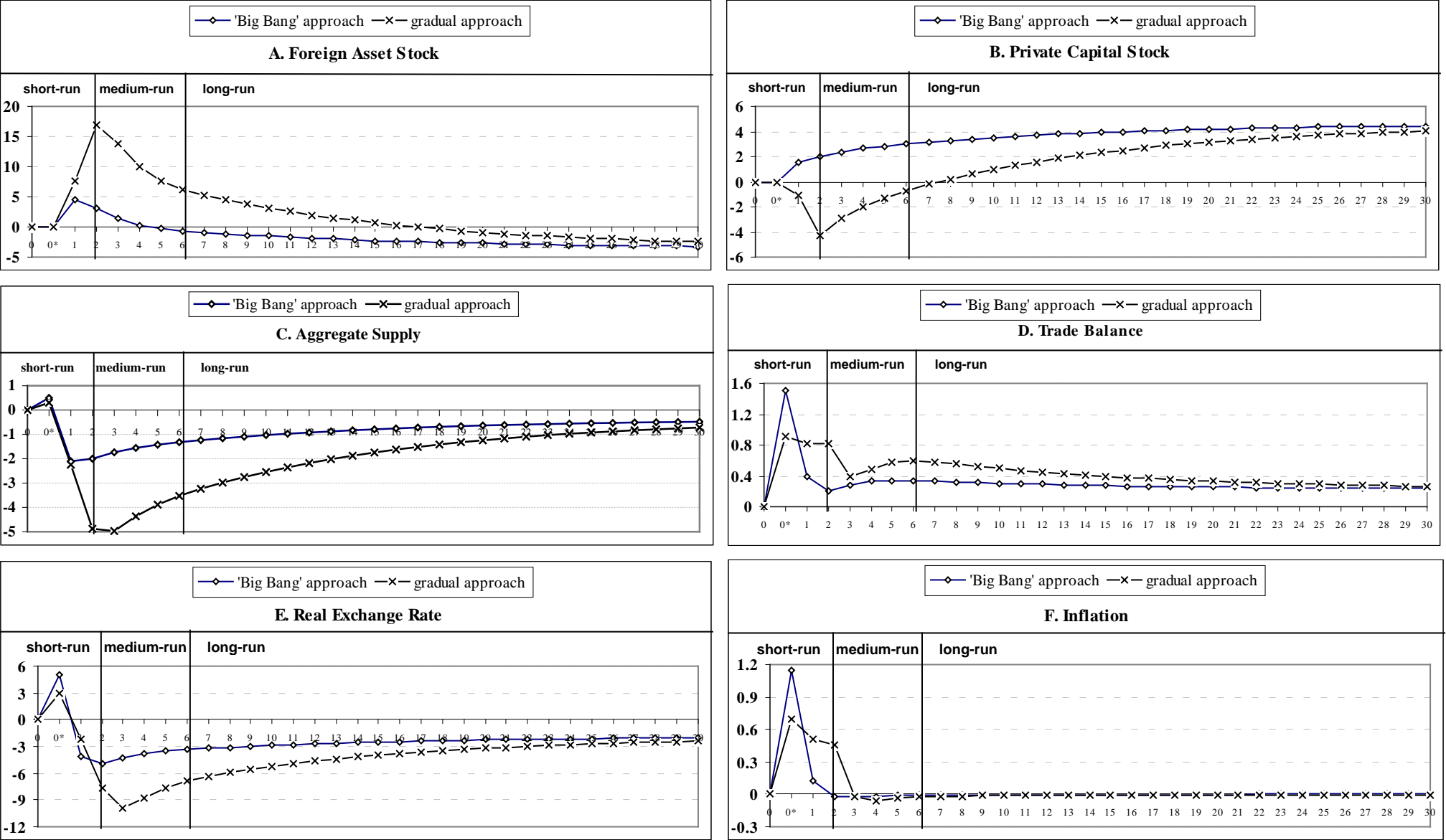


Figure 7-5: “Big Bang” Approach versus Gradual Approach under a Flexible Exchange Rate

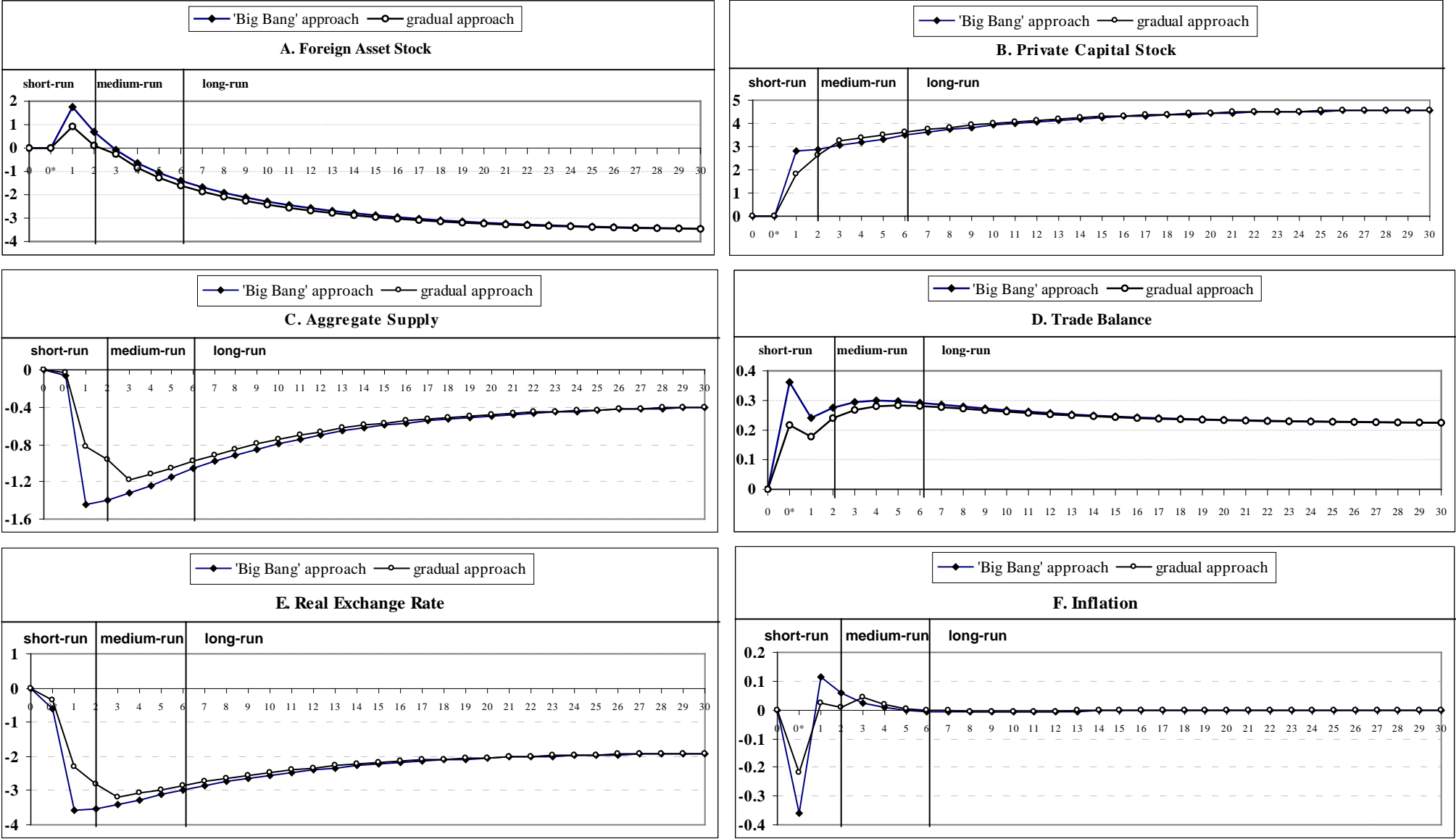


Figure 7-6: Comparison the “Big Bang” and Gradual Approaches Between Two Versions of the Exchange Rate

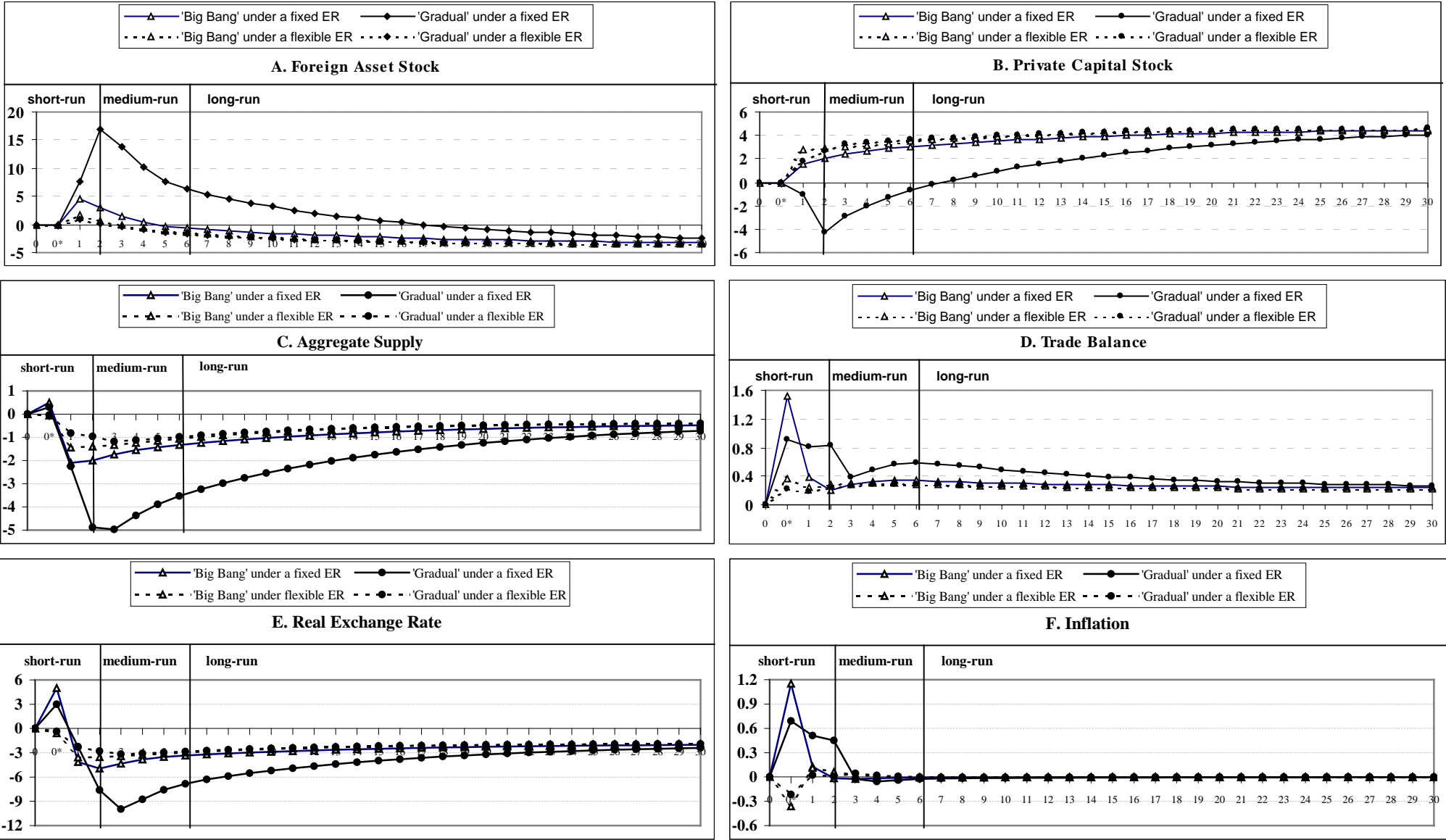
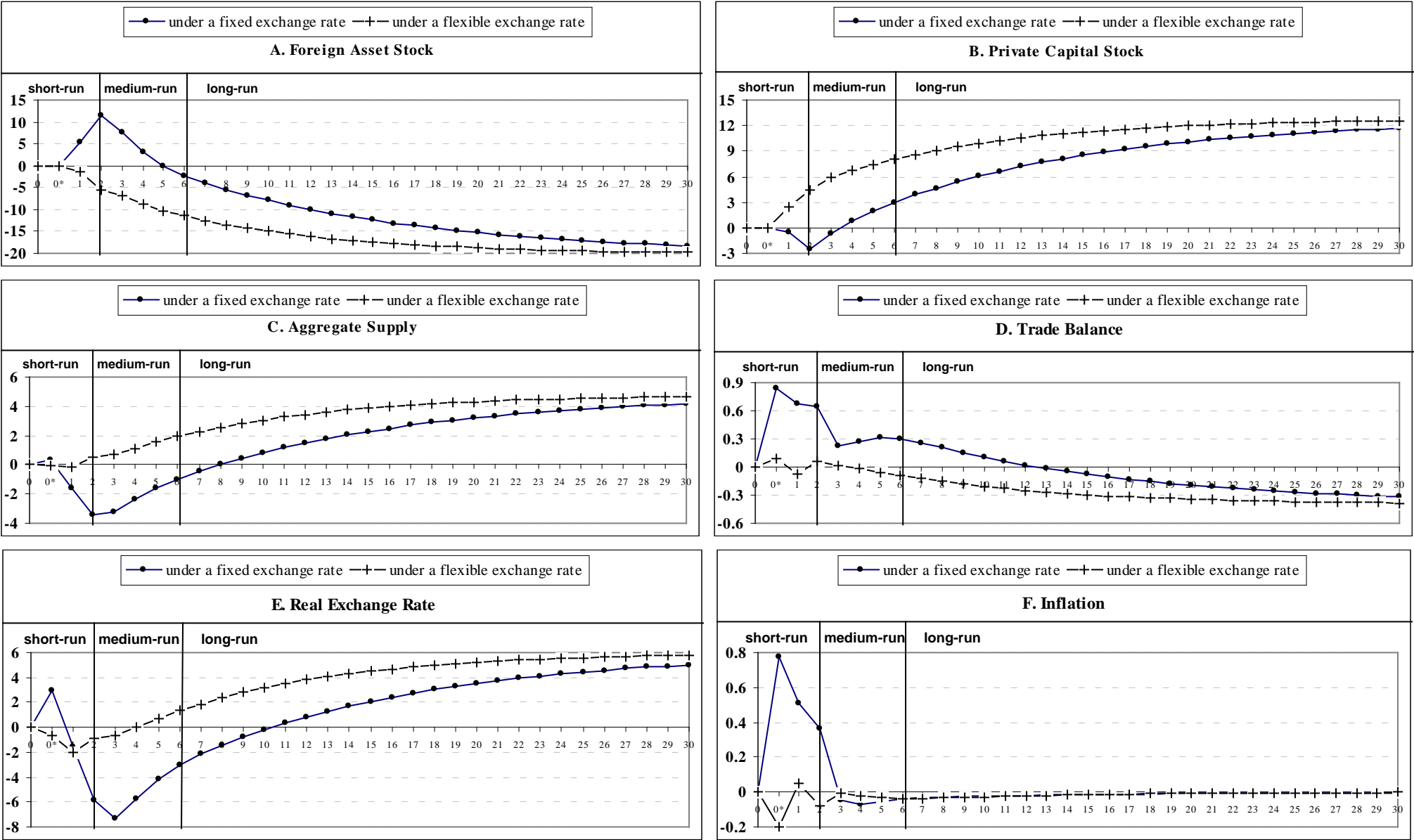


Figure 7-7: Temporary Change in Public Capital Expenditure combined with Reform Package



CHAPTER 8

SUMMARY AND CONCLUSIONS

8.1 Thesis summary and conclusions

This thesis has sought to accomplish three objectives. First, to identify the key policy areas involved in the process of transition from a planned to market economy, including that of macroeconomic stabilisation, price and market reform, restructuring and privatisation and the need to redefine the role of the state, and in particular to pay more attention to the hotly debated issue of their speed and sequencing. Second, to describe the macroeconomic background and to analyse the macroeconomic reform policies of the Vietnamese economy being applied since the *Doi Moi* policy began in 1986. The major macroeconomic problems currently facing the Vietnamese economy were also discussed. Third, to develop a long run dynamic macroeconomic model for Vietnam. The model developed emphasised the effects of the stabilisation and structural adjustment policies arising during the transition process to a market economy, and their impact upon the economic development of Vietnam. In particular, the speed of adjustment and sequencing of reform policies, introduced individually or as part of a package, was given particular attention.

The findings obtained from this study can provide an important basis for policy analysis and recommendations for Vietnam.

8.1.1 General review of the study

The collapse of planned socialism in Central and Eastern Europe in the late 1980s was attributed to the structural weakness of central planning in improving the standards of living of the population. The centrally planned economies, characterised by obsolete and uncompetitive productive capacities, macroeconomic imbalances, lack of modern infrastructure and factor markets, and weak institutions, could not last forever and required

change to another form of economy – a market economy - that could improve their current situation. To successfully transform to a market economy requires reform in a number of key areas. While there is general agreement on these basic measures, major disagreement relates to the speed and sequencing of such reforms. During the first years of the transition process the “Big Bang” approach was favoured by many economists and policy makers in Europe. In reality, however, it was primarily limited to the implementation of a rapid macroeconomic stabilisation program, with the process of restructuring the economy, including that of privatisation and the development of institutions required in the context of a market oriented economy, taking a much longer period of time to achieve – a gradual approach.

There has been considerable variation in the economic performance of the transition economies since the beginning of economic transition. For the CEE and CIS countries the initial part of the process was characterised by reduced production as well as a temporary, in most cases, dramatic increase in inflation. The extent and consistency of macroeconomic development policies have been pointed out as the main causes for the difference between each country’s performance, along with other factors such as their initial conditions, geography, history and culture.

By contrast, the experience of the East Asian transition countries – China and Vietnam – is considerably different in terms of growth and inflation. Neither suffered the declines in GDP growth, nor the significant increases in inflation. The stronger performance of these countries reflected not only more favourable initial conditions but also far-reaching reforms in a number of areas – agriculture, in particular – undertaken quite early in the process as well as a more gradual approach to economic transition.

In 1986, at the Sixth National Congress, the Vietnamese government decided to transform Vietnam from a centrally planned economy to a market oriented one. The slogan adopted for the economic reform program was *Doi Moi* (renovation) with the goal of conducting significant macroeconomic adjustment policies including stabilisation policies and structural reforms. While stabilisation policies aim at eliminating macroeconomic

imbalances through demand adjustment, structural adjustment policies aim at raising output growth through policies that bring about major changes in the microeconomic structure by promoting competitiveness, efficiency and dynamism among the production units within the system. A number of stabilisation policies, such as raising interest rates, devaluing and unifying the exchange rate, and reducing the budget deficit, were implemented. Structural adjustment policies, such as privatising the agricultural sector, reducing direct control over state-owned enterprises, eliminating state monopoly of foreign trade, liberalising prices, and eliminating the system of state procurement, were imposed to maintain and enhance economic stability as well as to change course and transform Vietnam into a market economy. However, during the transition period the speed of the implementation of these policies has been different depending on the internal and external situations.

While the reform policies during the period 1986-1988 were characterised as a gradual approach, the economic reforms in 1989 carried many characteristics of the “Big Bang” approach. Nevertheless, in response to the unfavourable external changes since the Asian financial crisis in 1997, the Vietnamese government has adopted a slowing down of economic reforms. Consequently, not only has economic growth been affected, but also there exist a number of obstacles for internal adjustment. First, a slow progress of state-owned enterprise privatisation, or restructuring, and under-development of the private sector are the crucial problems that Vietnam is now facing, requiring immediate attention otherwise they will bring further problems which will affect the long run economic efficiency of the Vietnamese economy. Second, as a member of ASEAN, APEC and potential member of WTO in the next few years, trade liberalisation, especially exchange rate and tariff policies, must be seen as important for the future development of the Vietnamese economy. Third, financial sector policy is another important issue for Vietnamese macroeconomic policy, since this sector is heavily regulated by the government. In addition, the speed of these adjustment policies and the sequencing of reforms, which have been extensively debated amongst economists, remain inconclusive, and must be examined in the context of Vietnam.

In response to these key issues in the context of the current situation in Vietnam, this study attempted to incorporate them into a model developed and presented in Chapter 5. First, the issue of state-owned enterprise privatisation involves the transfer of capital ownership from state-owned enterprises to the private sector, on the premise that the private sector is more efficient than the public sector. Second, devaluation of the exchange rate or applying a floating exchange rate system was also emphasised. Third, the movement towards trade liberalisation in terms of import and export tariff reductions needs further study. The Vietnamese government can only directly control barriers to its imports, however, as a member of international organisations such as ASEAN, APEC or WTO, it can also contribute to a reduction in trade barriers imposed by other countries on Vietnamese exports. Finally, the adoption of expansionary public investment spending to encourage infrastructure developments was examined. To analyse the implications of two alternative paths for these reform policies, “Big Bang” or Gradualism, simulations conducted in Chapter 7 introduced each policy either gradually or immediately, and then two more cases involving a multitude of policy instruments, designed to illustrate the more complex cases of gradualism and shock therapy approaches, were also considered.

8.1.2 Developing a macroeconomic model

The main objective of the present study has been the introduction and development of a dynamic long run macroeconomic model for Vietnam as a transition economy, focusing on the impact of reform policies on six key macroeconomic variables, namely foreign asset stocks, private capital stock, aggregate output supply, the trade balance, the real exchange rate, and inflation. These key variables have been chosen because they are important factors in the process of economic development of Vietnam, affecting economic growth and economic stability. Any changes in these variables arising from policy shocks, such as from a nominal exchange rate devaluation, privatisation of the SOE capital stock and tariff reduction, will have an impact on the development of other variables and the domestic economy as whole.

There is an extensive literature devoted to analysing the problems that emerged in the transition economies, with most of these having focused mainly on prospective macroeconomic adjustment in these transition economies. Some placed their attention on the linkage between economic performance during transition to variations in transition policies, others have placed their emphasis on the role of the privatisation process and on the relationship between the state and private sectors. However, no model in the literature enabled the identification of the way in which exogenous shocks transmit their effects to the domestic transition economies. In this sense, such recent studies for the case of Vietnam cannot be found. Moreover, so far none of the existing studies analysing the speed and sequencing of reform policies include the exchange rate, tariffs, restructuring or privatisation of SOEs, and monetary and fiscal policies. With the aforementioned objective, seeking an appropriate model from the existing literature outside that currently developed for the transition economies is indispensable. In this thesis three basic theoretical models contributed by Mundel-Fleming (1963), Dornbusch (1976) and Branson (1977, 1984), although not developed specifically to look at a transition economy, provided the basic building blocks for developing a dynamic macroeconomic model for Vietnam as a transition economy.

Apart from these three basic theoretical models the model developed for Vietnam in this study also had as its foundation the contributions of Harvie and Lee (HL) (1996) and Harvie and Kearney (HK) (1996), which are general equilibrium models focusing on the dynamic long run nature of the adjustment process. The main contributions of the HL and HK models are, primarily, that they incorporate capital stock accumulation in stimulating economic growth. In these models, the role of equity claims on the domestic physical capital stock in linking the financial and real sectors is also emphasised.

The model developed contained a number of key assumptions. The domestic economy produced output that is consumed domestically and is an imperfect substitute for the imported good equivalent. The price of these goods is domestically determined. The deterministic framework of the model, combined with economic agents possessing rational

expectations, is equivalent to the case of perfect foresight. Financial markets are assumed to be in continual equilibrium, while non-financial markets are subject to sticky price and quantity adjustment. The model developed focused on the long run nature of the dynamic adjustment process, because macroeconomic adjustment will exert a long run effect on the Vietnamese economy. This arises from allowing for physical capital stock accumulation and developments in the current account balance. It is assumed in the model that private and government capital spending contributes to an expansion of physical capital stock in the real sectors, improving the productivity capacity of domestic output, whilst SOE capital spending steadily declines resulting from the privatisation and restructuring policies that re-allocate the physical capital stock to the private sector. Most importantly, aggregate supply and aggregate demand for domestic output grow proportionally with the development of the physical capital stock. This arises from the fact that the underutilised labour supply is a non-constraint upon economic growth. Details of the model were presented in Chapter 5.

The model developed was used to analyse the implications of two alternative paths of economic reform for a transition economy like Vietnam operating in two alternative exchange rate and capital control systems, a fixed exchange rate with imperfect capital mobility and a flexible exchange rate with perfect capital mobility. The reform policies emphasised, in particular, related to that of SOE privatisation and restructuring, trade liberalisation, and public infrastructure capital spending.

8.1.3 Estimation of the model

The model was estimated, first, by the method of Ordinary Least Squares (OLS) regression. However, using this simple approach, which often ignores the non-stationary properties of the time series data, could cause misleading statistical and therefore economic inferences. It was therefore necessary to ensure that the time series were stationary before proceeding to econometric estimation.

Two methods were applied to examine the time series properties of the variables. From an informal examination, by graphing the data, it might be concluded that the

variables under consideration are non-stationary in the levels and first difference, but they are stationary in the second difference. This means that the variables are integrated of order $I(2)$. The formal augmented Dickey-Fuller (ADF) test was applied to test for the presence of unit roots. However, the conclusion of the order of the variables, $I(1)$ or $I(2)$, from this test are inconclusive because the critical values for unit root tests tabulated by Fuller (1976) or Dickey and Fuller (1981) have a sample size of at least 50, whilst the sample size of data used in this study was only 16 observations. The critical values for smaller sample sizes are not presently available.

With the assumption that the variables of interest are integrated of the same order of $I(1)$, two simple methods, Engle-Granger (EG) or Augmented Engle-Granger (AEG) test and the cointegrating regression Durbin Watson (CRWD) test provided by Sargan Bhargava (1983), were applied to detect for the existence of long run relationships between the variables involved. Where evidence of a long run relationship is found, the error correction model (Granger, (1986) and Engle and Granger (1987)) was estimated by OLS, incorporating the short run dynamics of the system with the information from the long run cointegration relationship. However, these procedures are not applied when it is assumed that the variables are integrated of order $I(2)$ due to the limitation of small sample size.

This study also applied the bootstrap method, initiated by Efron (1979), for correcting the problem of small sample size. The bootstrap method in OLS regressions was conducted first to examine how good the OLS coefficient values previously estimated are and whether they are biased. This approach was also utilised to confirm the conclusions of non-stationarity of the variables obtained from the formal unit root tests.

Although having been affected by a serious “degrees of freedom” problem, the OLS regression based on the levels of the logarithm variables seemed to give reliable coefficients in terms of their magnitudes. This conclusion was confirmed when several other approaches were conducted to check for similar results. Therefore, it proved useful in providing a range of possible parameter values to be used in the simulation analysis conducted in Chapter 7.

8.1.4 Simulation analysis and policy implications

The parameters obtained from the estimation of the model, along with imposed parameter values derived from existing studies where appropriate, were then used to conduct a simulation analysis to examine what policy options should be used in response to external shocks. Due to the complexity of the model developed, it was not possible to derive analytically unambiguous results for the steady state properties of the model. Thus, an analysis of the steady state and dynamic properties of the model was conducted by means of a numerical simulation or calibration. The program utilised to derive these results is called “Saddlepoint”, which is designed for solving linear rational expectations models with constant coefficients.

The simulation analysis was conducted in order to derive certain conclusions about the effect of alternative paths for the Vietnamese economy, corresponding to different assumptions regarding policy changes and reforms. Three types of policy reforms in the simulation analysis were assumed as exogenous shocks: (1) in carrying out privatisation it was assumed that 5 per cent of the capital stock of SOEs was given to the private sector; (2) the nominal exchange rate was assumed to be devalued by 5 per cent; (3) and the tariff rate was assumed to be reduced by 5 per cent. For each shock, the simulation was carried out at different speeds. In the first case a gradual process occurred, while in the second case an immediate change took place on impact. A comparison between them was then conducted. Two extreme reform packages, involving a multitude of policy instruments designed to illustrate the more complex cases of gradualism and shock therapy approaches, were eventually considered. In both simulations, privatisation, tariff reform, and devaluation were undertaken, with the only difference being the speed with which these actions were taken. In addition, the shocks involving the privatisation of the SOE capital stock and tariff reduction were considered in an alternative model, in which it was assumed that capital mobility is perfect and the nominal exchange rate is flexible. This was then compared with the fixed exchange rate and imperfect capital mobility version of the model. The impact of

the changes in government capital expenditure, combined with the reform policies on the Vietnamese economy, was also explicitly analysed.

The major findings were that a nominal exchange rate devaluation under a fixed exchange rate, for both “Big Bang” and gradual approaches, can have favourable impacts upon external developments. The devaluation of the nominal exchange rate leads to a depreciation in the real exchange rate in the short run, contributing to an improvement of competitiveness and a better performance externally – trade and current accounts. This policy produces, as well, favourable impacts in terms of aggregate output on impact. However, the exchange rate devaluation also stimulates inflation, which gradually dampens economic growth in the short and medium periods. This result is similar to that obtained from the model by Sand-Zantman et al. (2000) (see Table 4.2 in Chapter 4). The exchange rate devaluation policy has the disadvantage of maintaining a lower value for the q ratio, which has an adverse impact on investment, private capital stock and aggregate supply as well. The biggest problem appears to be over the medium to long run where the real exchange rate appreciates, and the trade balance eventually deteriorates bringing down foreign asset stocks. It is noticeable that this policy has the largest positive impact during the first year of the short run period in terms of external improvements and domestic output. Hence, if the government gives priority to short-term policy outcomes this simulation result support such a policy. Another important finding is that the government should apply the “Big Bang” approach for this policy, because this can minimise the deterioration of the private capital stock, aggregate supply, and international competitiveness during the adjustment process.

A policy of tariff reduction could also have a potentially adverse impact upon the development of the Vietnamese economy. The major long-term losers from this policy, irrespective of whether the change is up-front or partial, are in regard to a decline in both the private capital stock and aggregate supply. However, like the finding from both the Fukase and Martin (1999) and Ianchovichina et al. (2000) (see Table 4.2 in Chapter 4) models the major benefits from this policy are the trade balance surplus, increased foreign

asset stocks, and the real exchange rate appreciation. In the long run steady state there would be no difference in the effect upon the macroeconomic variables irrespective of whether an up-front or gradual tariff reduction had been applied. However, for the short run period, an up-front tariff reduction would have to be pursued if maximising the foreign asset stocks and trade balance and minimising the decline of aggregate supply and the private capital stock are the primary considerations. But over the medium term this approach may hurt the economy in regards to external developments including foreign asset stocks, the trade balance and real exchange rate. As far as the developments of these variables are concerned, the gradual tariff reduction approach is the suggested policy to be pursued.

The implications of an increase in the capital of state-owned enterprises transferred to the private sector (privatisation policy) under the fixed exchange rate system, is a possible increase in private investment and private wealth (financial market) that results in a large impact on real economic activity. The resulting higher private capital stock causes aggregate supply to rise. An increase of privatised assets from SOEs contributes to an improvement in the trade balance in the short and medium run periods, due to a depreciation of the exchange rate, and also due to aggregate demand being less than aggregate supply and an improvement of foreign asset stocks. However, the long run period sees a slight deterioration in the trade balance, reflecting a rise in aggregate demand. The other implication is that, if maximising the private capital stock, foreign capital stock and trade balance are the primary considerations in the short run period, immediate privatisation would have to be pursued. However, if minimising the deterioration of domestic production and strengthening international competition are the only considerations, then privatisation introduced gradually becomes the “best” approach.

Overall, the main findings from the simulation results for the single policy cases (exchange rate devaluation, tariff reduction, and privatisation) indicate that, for the short run period, the government should adopt the “Big Bang” approach because this has positive impacts upon Vietnamese economic development. For the medium and long run periods

this approach would still be advisable for the exchange rate devaluation because by this approach the deterioration of the private capital stock, aggregate supply, and international competitiveness could be minimised. However, there is no different impact upon the Vietnamese economic development irrespective of whether the application of the tariff reduction and SOE privatisation is up-front or partial.

In looking at the complete policy package including devaluation, tariff reduction and privatisation of SOE capital stocks under the regime of a fixed exchange rate, for the short and medium periods, the “Big Bang” approach is better in terms of a smaller deterioration in domestic production, a smaller appreciation in the real exchange rate, and a more pronounced improvement in the private capital stock. However, the development of the real foreign asset stocks is more pronounced and there is a more oscillatory adjustment of the trade balance under the gradual approach for these periods.

The implications of the reform package including tariff reduction and privatisation under the assumption of a flexible exchange rate and perfect capital mobility system, is a positive impact on real economic activity. A gradual and immediate approach can lead to an improvement in the private capital stock, aggregate supply and the trade balance in the long run steady state. However, it results in an appreciation in the real exchange rate. Under this exchange rate system, a divergence in the adjustment of the key macroeconomic variables of interest is apparent only over the short and medium runs. Although experiencing the same benefits as those from the fixed exchange rate regime in the long run steady state, with a flexible exchange rate the gradual approach is somewhat better than its alternative as a less oscillatory adjustment of aggregate supply and the trade balance is apparent during these periods in time.

A comparison between the two versions of the exchange rate, in which the reform package is applied, suggests that the gradual approach under a flexible exchange rate is preferred if a primary objective of policy is to produce a better outcome in terms of domestic production, private capital stock, and the real exchange rate. In view of the

multitude of factors involved, however, it may remain inconclusive, reflecting the complexities of the issues involved.

A policy of an expansion in government capital expenditure combined with a reform package could lead to an overall “crowding in” effect on private investment, and an increase in the productive capital stock. This would have a positive effect upon the long run productive potential of the economy. Under a fixed exchange rate this policy can lead to a temporary economic contraction, in particular during the short and medium runs, reflecting the large capital losses and hence wealth experienced by residents. This policy may also produce an improvement in the trade balance and a depreciation in the real exchange rate on impact and in the short run, but the medium and long runs see a deterioration in the trade balance and foreign asset stocks resulting from a sharp appreciation in the real exchange rate. However, with a flexible exchange rate the expansionary fiscal policy combined with a reform package can lead to consistent economic development from the short run to the steady state.

Overall, the conclusions derived from the simulations of the reform package are (i) a flexible exchange rate and perfect capital mobility mechanism appears to be most appropriate for the economy of Vietnam when some reform policies are undertaken simultaneously, and (ii) the gradual application of these policies is advisable.

8.2 Further studies

Macroeconomic modelling is an evolutionary process that will continue to reflect new developments in economic theory, new econometric methods, and better understanding of the structure of transition economies in general and Vietnam in particular. This study has focused primarily upon developing a dynamic long run macroeconomic model for Vietnam to analyse the impact of structural adjustment since it applied the *Doi Moi* policy in 1986 upon key macroeconomic variables. From this, major policy lessons arising from the impact of external and reform policy shocks on the Vietnamese economy can be drawn. Quite clearly, the model presented should be seen as a first exploration of

complex issues. While it is believed that the results shed some light on the role of the reform policies during the transition process, further research must explore some of its limitations. In addition, since the database for examining the impact of macroeconomic adjustment policies since 1986 is too short a period, and many kinds of data required for model design are certainly not available for accurate empirical testing, there is a need for more detailed empirical work in the future.

Specifically there is a need to further explore the following:

1. With the assumption that in carrying out privatisation the capital of the publicly owned SOEs is simply given to the private sector, and that privatisation leads to an increase in the private capital stock, it is weak to draw any strong conclusions about the impact of the state-owned enterprise privatisation policy. In developing a model to examine this policy, a further study could develop a model incorporating the production functions for both state and private sectors. The output of these sectors depends on capital accumulation, labour productivity and technology. The privatisation policy results in not only a simple change of the ownership of productive capital but also represents a shift of workers from state enterprises to the private sector. Wage differences between the two sectors, which affect the decisions of workers to stay or move away from the state sector, must also be incorporated in the model. In particular, currently in Vietnam there is the continuing existence of soft budget constraints in the state sector, such as that arising from the provision of initial capital investment, tax arrears for loss making companies, and favourable bank loan interest rates. Hence, in a model for analysing the privatisation policy, there is a need to develop a model incorporating the production functions and wages for both sectors, and incorporate the issue of soft budget constraints.

2. The model developed in this study focused upon the effects of external shocks and reform policies on a single economy, that of Vietnam. Nevertheless, since Vietnam currently is a member of AFTA, it would be useful to examine the spillover effects of shocks and policies from one (or some) member to another, with emphasis placed upon the channels through which events in one economy (or AFTA members as a whole) are

transmitted to others. An explicit two-country model could be developed by assuming that one country is large (AFTA members economy) and the other small (Vietnam). This kind of model could be used to analyse the effects of policy changes, such as exchange rate, monetary and financial policies, carried out by the large economy on the small economy, and the advantages and disadvantages arising from closer policy coordination in these areas.

3. Although this study has distinguished the contributions of state and private sectors to aggregate supply, the different ownership between domestic private and foreign private is not explicitly incorporated in the model. The foreign investment sector should also be incorporated in the model design for the case of Vietnam, since this sector, which currently contributes to a sizeable proportion of aggregate supply, has been strongly affected by the external shocks and policy changes. The model developed in this study has also not distinguished the contributions of the production sectors such as industry, agriculture and services to aggregate output. In order to have an appropriate development strategy for such sectors the model developed in any future study should incorporate explicitly these sectors (disaggregating the model by sector).

4. One must also examine the issues of income tax or value added tax (VAT) (which has recently been introduced in Vietnam) and foreign borrowing in the context of government revenues and borrowing. It is in this direction that the fiscal sector needs to be modified. Government consumption would depend on government revenues arising from income tax or VAT and foreign borrowing, instead of it being assumed to be an exogenous variable as in the present study. This would provide the basis for an investigation of the effectiveness of tax policy reform and debt service obligations from foreign borrowing.

5. The issue of massive non-performing loans in the banking sector, which is obviously a crucial factor in obstructing Vietnamese economic development, has resulted from a slow process of SOE privatisation (see Chapter 3). Therefore the banking sector, both in their liabilities and assets, should appear explicitly in the model in order to analyse

the impact of the privatisation policy and other external shocks such as exchange rate devaluation, international interest rate, and monetary expansion policy upon it.

Overall, the major objective of this study has been to develop a dynamic and long run macroeconomic model for Vietnam, which has not been done by either internal or external economists, taking into account the impact of the reform policies as a package and their speeds of implementation upon the country's economic development. The model developed is able to identify the long run steady state properties of key macroeconomic variables, as well as the adjustment process arising to steady state from external and policy induced adjustment shocks. This study provides a basis for comparing alternative options in regard to improving the benefits, and to reduce the adverse effects, of reform policies upon the Vietnamese economy. In addition, this model also offers an important framework within which a wide range of possible reform policies can be analysed and evaluated. Furthermore, the model developed, and the policy implications derived from it, provides important guidelines for Vietnamese policy makers, as the results suggest that the Vietnamese economy would benefit from the effects of economic liberalisation and structural change.

This study not only provides a framework for analysing some key issues confronting the Vietnamese economy, but is also applicable, upon suitable amendment, to other transition economies in Europe, including that of the former Soviet Union, which also have the same objective of successfully transforming to a market-oriented economy.

APPENDIX 3.1

A. State-Owned Enterprises: The Road to Reform

1988

- A substantial increase in enterprise autonomy: managers were given the authority to set most prices, select appropriate mixes of inputs and outputs, layoff excess workers, and determine their investment programs.
- Establish a legal framework to support SOE operations: all enterprises were subject to more uniform rules of taxation; allow more enterprises to establish trade links or use trade companies of their own choice rather than a prescribed trade channel; and expose all enterprises to more foreign competition through liberalising the trade regime.

1989

- All SOEs were subject to a hard budget constraint: most subsidies to enterprises were sharply cut with the price liberalisation and the unification of the exchange rate; reduction of SOE subsidies, restriction on public sector investment, demobilisation of the military, ceilings on wage rises for civil servants.

1990

- Liquidation procedures for SOEs were first introduced: the State Enterprise Liquidation Regulations apply to SOEs which cannot sell their products, cannot fulfil their business purpose, have continuous losses, cannot repay their debts, or cannot overcome current financial difficulties. The liquidation procedures were only applied to small and medium SOEs in non-essential lines of business, and left outside the scope of the regulations was the liquidation of large SOEs or those providing important products or those for whom dissolution would have a “bad influences” on other fields or enterprises. Liquidation under the regulations takes one of several forms: total or partial merger with other state enterprises; total or partial sale of assets to other enterprises (public or private); or lease. If an individual

or institution is willing to buy the enterprise as a going concern, then priority should be given to reducing the total price.

1991

- Greater financial autonomy given to SOEs: the rights of SOEs to manage their assets and the concomitant obligations to maintain and repair them were established. All proceeds from the sale, transfer, or liquidation of fixed assets can only be used by the state enterprise for reinvestment in fixed assets.
- The Regulations on Establishment and Liquidation of State Enterprises were enacted, and provided rules for the process of state enterprise formation and the objectives for their operation. Under this provision, the economic functions of the SOEs are somewhat limited by the state. In addition, social and political functions are added to the administrative burden of SOEs, representing a positive disadvantage in competition with private business and companies that are not similarly burdened.

1992

- A package of state enterprise reforms was introduced: continuing the reorganisation of the state-run economy; reforming state enterprise sector management; continuing the experiment with boards of directors, and then promulgating regulations on boards of directors; an experiment in state enterprise privatisation, which can take the form of organising new joint ventures with foreign investors, selling shares of state enterprises to foreigners, selling shares of state enterprises to domestic institutions or individuals, or selling shares to workers and cadres; and strengthening and reorganising joint enterprises and holding companies.

1994

- A plan for the restructuring of SOEs in selected sectors (electricity, oil and gas) was introduced.
- A list of provisions of SOE bonds/shares was issued.

1995

- The State Enterprise Law was passed: providing a blueprint for strengthening the sector by limiting the state's financial responsibility, establishing rules to control the creation of new enterprises, improving the monitoring and supervision of enterprises, and allowing greater managerial autonomy.
- The National Investment Fund was created to provide preferential credits for selected sectors (coal, electricity, cement, oil and gas, maritime, coffee, rubber, garments, tobacco, steel, paper, food, aviation) and disadvantaged regions.
- Decrees on model statute for SOEs and on SOE reorganisation were enacted.

1996

- General Corporations were established: nearly half of the state enterprises were grouped under 18 big holding companies as General Corporations. Another 80 smaller groupings known as Special Corporations were also formed.
- The SOE Equitisation Committee was established: there were a number of statutes on the setting up, reorganisation, dissolution of SOEs, on SOE operating conditions, on transforming SOE into joint-stock company, and on SOE financial management.

1997

- Regulations for the management boards and control commissions of SOEs were issued.

1998

- Equitisation targets were announced for 150 enterprises by the end 1998, 400 by end 1999, and 1000 by end 2000. A list of SOEs to be equitised was approved.
- The main policies to guide the restructuring of enterprises and set out the framework for classification in terms of plans for ownership diversification, were put into effect.
- A decree clarifying and simplifying the equitisation process was issued.

- The National Enterprise Reform Committee (NERC) was set up with responsibilities for the SOE sector, as a national level organisation to tackle SOE reforms.

1999

- A program of complete divestiture of small enterprises, either by tender, or complete sale to employees, was announced, but the regulations have not yet been used.
- A review of the large general corporations was conducted. It called for maintaining and strengthening the general corporations and the development of plans to form conglomerates on a pilot basis.

2000-2001

- The government adopted a five-year SOE reform plan, with annual targets specified for 2001-2003, with the objectives of reducing losses and improving competitiveness. Around 1,800 out of the more than 5,500 SOEs will be subject to enterprise-specific reform measures, mostly through equitisation (1,400), divestiture (140), or liquidation/closure (220). An additional 200 enterprises will face merger/consolidation. These enterprises are mainly small and medium-sized SOEs in terms of state capital (11 per cent of total) and SOE debt (10 per cent of total), but they account for 31 per cent of total SOE employment.

2002

- SOEs were categorised following their importance to the economy: the state shall hold full ownership in a wide range of areas deemed strategic, or in businesses that are essential for production development, and for the enhancement of living conditions in rural, mountainous and remote areas.
- Some of the industries where enterprises are to be equitised, handed over to employees, or sold, were specified.
- One decree issued in 1998 regarding the equitisation of SOE was replaced. It now gave the right to buy shares to both Vietnamese and foreign organisations and

individuals. Outsiders are now entitled to buy up to 30 per cent of the charter capital of a company. A number of financial benefits were also introduced for equitised enterprises.

- SOEs were instructed to settle their outstanding debts: those that have large unrecoverable debts are to be liquidated or declared bankrupt.

Sources: IMF and World Bank Reports, various issues.

B. A Timeline of Trade Reform in Vietnam

1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
			Foreign trading floor introduced at SBVN								
	Customs tariff introduced for the first time		Imported inputs used to produce exports exempt from duty				Import permit system relaxed			Controls on entry into international trading activities relaxed	
Retention, use of foreign exchange liberalised	Budgetary export subsidies eliminated		Export processing zones regulation introduced		Export shipment licensing relaxed		Vietnam joins ASEAN and AFTA				Decree 57 liberalising right to import and export
	Export tax system	Special sales	Export duty on rice reduced from 10 to 1 per cent		Duty rebate system improved	Import permits eliminated for all but 15 products	Import quota goods reduced to seven	Maximum tariff reduced to 80 percent	WTO accession process started	Management of consumer quota goods shifts to tariffs	
			Private	Trade agreement with EU		GATT observer				Highest tariff reduced to 60	
		Export of certain commodities limited to relevant exporters associations					Export taxes raised on 11 products		Imports of sugar prohibited	Partial surrender requirement	Decree 254 adds to list of conditional imports
									Temporary		

2000-2001	2002
Quantitative restrictions on some items were eliminated ahead of schedule and replaced with tariffs	Quantitative restrictions on some other items were removed ahead of schedule.
Changes in tariff lines consistent with the commitments under AFTA	Further changes in tariff lines consistent with the commitments under AFTA

Sources: IMF Reports, various issues.

C. Exchange Rate Reform

1989

- The nominal exchange rate was devaluated sharply.
- Foreign exchange trading floors in Ho Chi Minh City and Hanoi were opened to assist in managing the exchange rate.
- The official exchange rate matched the level of the parallel market rate.

1990-1991

- The official exchange rate was devaluated regularly in line with inflation, so that the real exchange rate was fairly stable.

1992

- The strengthened credit policies, combined with the improved balance of payments situation, caused an appreciation in the exchange rate.
- The State Bank intervened in the foreign exchange market to prevent nominal appreciation.

1997

- The exchange rate depreciated by 5 per cent due to the government widening the band around the central rate, to give itself more latitude in foreign exchange management in the face of downward pressure on the Dong.

2001

- Exchange rate management becomes more flexible, and the Dong depreciates against the US dollar by about 3.5 per cent.
- The foreign exchange surrender requirement was reduced from 50 to 40 per cent.

Sources: IMF and World Bank Reports, various issues.

D. Fiscal Policy Reform

1990

- Budgetary expenditure is reduced significantly by the elimination of budgetary subsidies to state enterprises and large military demobilisation.
- New taxes like housing and land tax, personal income tax, and profit tax are introduced.
- A comprehensive tax system reform, together with tax administration reform, was planned in cooperation with the IMF.

1994

- Land-user rights tax laws were enacted.

1995

- Turnover tax, special consumption tax laws were amended.
- Statutes on revenue collection from rental housing were applied.

1996

- Budget Law was approved and became effective.
- Decrees on implementing turnover and special consumption taxes were issued.

1997

- Two tax laws were approved: (a) the multi-rated profit tax with a single-rate enterprise income tax and (b) the turnover tax with a three-rated value-added tax.
- Restructured commercial external debt through a Brady-type debt and debt-service reduction agreement with London Club commercial creditors.

1998

- Law on a special sales tax was approved.
- Budget Law was amended to improve assignment and allocation of tax revenue to the communes, the lowest local level.

- Issued Decree to implement External Debt Management Strategy allocating responsibilities for maintaining debt and for implementing the debt strategy.
- Approved new Decree to publish state, provincial and commune budgets every year starting in end-1998.

1999

- Two tax laws approved in 1997, value-added tax (VAT) and Enterprise Income Tax Law, became effective.

2002

- Budget Law was amended and approved with some new provisions.

APPENDIX 3.2

A Comparison of the Main Aspects of Enterprise Reforms in China and Vietnam

China	Vietnam
<p>1. Overview of the SOE sector</p> <p><i>View of the state sector</i> China undertook market-oriented reforms in order to stimulate economic growth rather than transform its economic system, and has taken a pragmatic approach to SOE reforms. The constitution has been amended to give an equal role to the private sector.</p> <p><i>Size of SOEs</i> There are about 250,000 SOEs employing 11 per cent of the workforce. The SOE sector accounts for one-fourth of GDP, and the share in industrial output of SOEs has fallen from 55 per cent in 1990 to under 25 per cent in 1998.</p> <p><i>Share of large enterprises</i> Large SOEs play a dominant role. The roughly 5,000 large enterprises among the 85,000 industrial SOEs with independent accounting systems, account for 70 per cent of SOE assets and two-thirds of gross output.</p> <p><i>Areas reserved for the state</i> The SOEs play a dominant role in key sectors: (i) energy and utilities; (ii) military and hardware industries; (iii) infrastructure and capital-intensive industries; (iv) essential services, such as grain distribution and finance. This has left a large number of “competitive” sectors where the state’s ownership is not considered necessary.</p> <p>2. SOE reform strategy</p> <p><i>Progress so far</i> Statements by key political leaders since 1997 have clarified the macroeconomic and industry level reform strategy, particularly for the large enterprises, and have opened the door for further ownership restructuring of SOEs.</p> <p><i>Focus of SOE reform</i> The central government’s SOE reform agenda has focused on improving management and governance in large SOEs, under the guiding principle of “seize the big and release the small”. Small SOEs, which are the responsibility of local government, have been explicitly encouraged to leave the state sector.</p>	<p>The market mechanism is seen as an instrument to stimulate economic growth, rather than as a goal. The dominance of the state sector is still considered to be crucial. The constitution stipulates that SOEs should have a leading role in the economy</p> <p>There are about 6,000 SOEs. The SOE share of industrial production has fallen from 78 per cent in 1990 to 55 per cent in 1997.</p> <p>The SOE sector is highly concentrated. The 200 largest enterprises account for about 60 per cent of both state capital and bank credit to SOEs, and 40 per cent of total SOE debt.</p> <p>Officially there is a negative list of areas reserved for the state under equitisation. However, equitisation has proceeded so slowly that this list is far from binding. SOEs in the sector and the local People’s Committee can veto the entry of any new business.</p> <p>The authorities’ policy goal has remained that an efficient state sector should continue to lead growth, and there has been reluctance to reduce the role of the state in the economy.</p> <p>There has been very little progress in the 1990s. The authorities envision implementing further SOE reform, including diversification of SOE ownership, but they have focused on small and medium-size enterprises, with the large SOEs mostly untouched.</p>

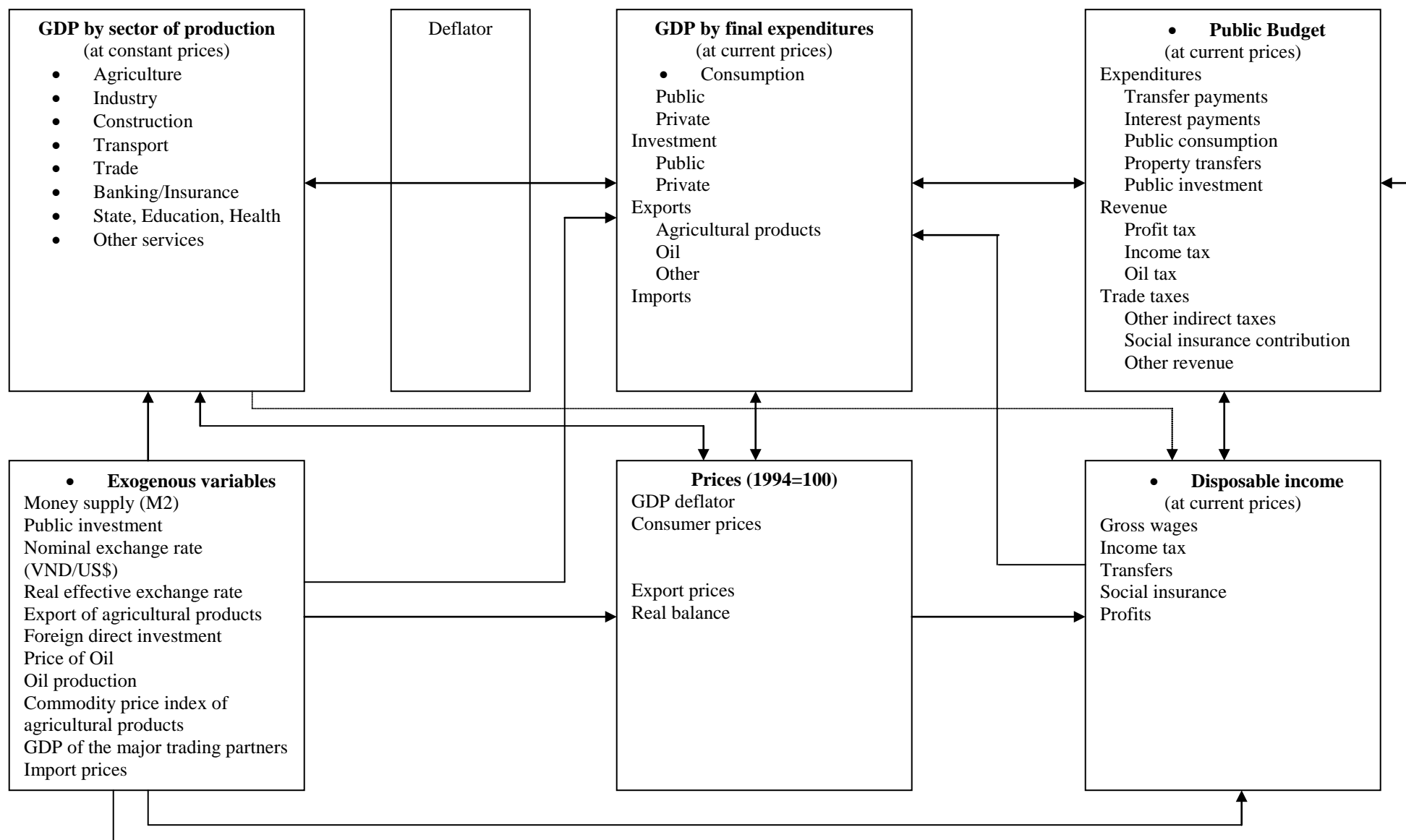
China	Vietnam
<p>Macroeconomic adjustment In an effort to reduce the macroeconomic burden, China has undertaken economic reforms for SOEs, including the hardening of budget constraints, exit of uncompetitive resources, removing social burdens, and reducing indebtedness.</p> <p>Budget constraints for SOEs have been progressively hardened. However, directed lending to loss-making SOEs has continued.</p> <p>SOEs have laid-off redundant workers and idled production capacity in response to market pressures. A cumulative total of at least 17 million workers had been laid off by end-1998.</p> <p>The government implemented policies to reduce the indebtedness of SOEs, including establishing funds for debt write-down. However, the scope for such write-downs remains constrained by a lack of financing.</p> <p>In order to divest SOEs of their traditional social welfare burdens, non-productive social services units, such as housing, are being transferred to the government, and pension and unemployment liabilities are being lightened.</p> <p>Enterprise management and organisation About 2,600 SOEs, mostly large, had adopted modern corporate forms of governance (corporatisation) by end-1997, being subject to the Company Law. Among corporatised SOEs, about half have adopted multiple-investor status. Other investors were mainly other state entities, including management and workers.</p> <p>For enterprise autonomy, central government restructuring has eliminated the industrial branch ministries, further removing government from day to day management of SOEs. However, government control over enterprise management has not been fully removed</p> <p>Ownership reform For large SOEs, activity was concentrated in stock issuance, both domestically and abroad, and the creation of joint ventures with foreign investors. About 950 enterprises had been listed on the stock exchanges. However, the ownership reform process for large SOEs has been slow.</p>	<p>The current cautious approach to SOE reforms does not support macroeconomic stability. Comprehensive reform plans, as well as concrete reform actions, need to be taken urgently.</p> <p>The budget subsidies were cut substantially in the early 1990s, but SOEs have received considerable bank financing.</p> <p>Enterprise employment rolls were cut substantially in the early 1990s, but there has been little restructuring since then.</p> <p>Some limited plans have been developed to address the heavy debt burden of SOEs, but implementation has been tied up with bank reform.</p> <p>Industrial SOEs provided few social functions beyond employment and retirement incomes. Retirement incomes have been take over by the government, but employment concerns continue to constrain reforms.</p> <p>Equitisation has proceeded very slowly, although there has been a modest pick-up recently.</p> <p>The Vietnamese SOEs have largely achieved autonomy in basic production and marketing decisions. However, financial autonomy and market discipline remain weak.</p> <p>Little has been done for large SOEs beyond the formation of General Corporations. Currently, only 19 companies, which are all former SOEs transformed into joint-stock companies, and 18 bonds are listed, with a total market capitalisation of about 105 million US dollars. Also, sale of enterprise shares to foreign investors is limited.</p>

China	Vietnam
<p>Also, 120 key production SOEs have been given the right to form large holding structures, aimed at achieving economies of scale and playing an instrumental role in the restructuring of other enterprises.</p> <p><i>Small SOEs</i> continue to be quickly moved out of the state sector. By 1998, the fast reforming coastal and southern provinces had already shed most of their small-and medium-sized enterprises.</p> <p>The many small SOEs have been sold to management and workers as shareholding collectives, or are being auctioned or offered for public sale.</p> <p><i>Social aspects</i> Excess labour in SOEs was estimated to be over one-third of the SOE labour force, about half of which have already been laid off. For retrenched workers the government focused on training and reemployment, while providing a basic living allowance.</p>	<p>General Corporations have been established for large, strategic SOEs to exploit economies of scale. However, they have restricted competition rather than improved their efficiency.</p> <p>About 150 medium-sized SOEs have been equitised since 1992, 130 of them since end 1997, and a total of 1,800 are planned by end 2005.</p> <p>Enterprises with capital of VND 1 billion (\$72,000) will be sold as a unit by tender, or to employees if bidding is unsuccessful.</p> <p>Excess labour in SOEs is estimated to be at least 25 per cent. Severance payment covers half a month of basic salary per year of service. While there are programs for retrenched workers, including income support, training, and subsidised credit, few have taken them voluntarily.</p>
<p>3. Complementary reforms</p> <p><i>Private sector development (level playing field)</i> While China still advocates a strong role of the state, it continues broad support for market-determined price and production decisions, and is taking steps to improve the business environment for private enterprises. SOEs have lost their former stronghold position in many industrial and service sectors, and competitive pressure from non-state sources is pervasive.</p> <p><i>Competition for joint ventures and imports</i> Joint-ventures in China have been effective in creating domestic competition. One key reason is flexibility in choosing a local partner. Many joint-ventures are export-oriented, and some have achieved a relatively high quality level.</p> <p>Even though China has high import protection, the borders are porous, and there are many avenues for exemptions. Tariff receipts are 3 per cent of imports.</p>	<p>There has been little progress in levelling the playing field with regard to the private sector. Throughout the 1990s SOEs continued to enjoy various privileges, which have allowed many inefficient state enterprises to survive.</p> <p>In Vietnam, joint-ventures must accept the designated local partner, which is often the same SOE for all entrants to that sector. Most joint-ventures have been set up for import substitution behind protection. Their scale is typically too small to compete on global markets.</p> <p>Although there is a great deal of smuggling in Vietnam, it is less dramatic than China. Moreover, the effective tariff in Vietnam is 15 per cent.</p>

Source: IMF Report, 1999.

APPENDIX 4.1

Structural Macroeconometric Model of Vietnam



The list of equations in the macroeconometric model of Vietnam

1. $AGRIFOR = PCN/PRICE + EXAGRIN/PRICE$
2. $INDR = KFIDONGR + GDPN/PGDP + INDR(-1)$
3. $CONSTR = GDPR + GCFEXP/PGDP$
4. $TRANSCOR/CRISIS_RES = PCN/PRICE$
5. $TRADER/CRISIS_RES = PCN/PRICE + EXN/PEX$
6. $LOG(BANKINGR/CRISIS_RES) = LOG(FIDONGR) + LOG(NDC/PRICE) + LOG(GDPR)$
7. $LOG(STEDHER) = LOG(STCEXP/PRICE) + LOG(GDPN/PGDP)$
8. $OTHERR/CRISIS_RES = D(GDPR) + OTHERR(-1)$
9. $SERV = TRANSCOR + TRADER + BANKINSR + STEDHER$
10. $FDPR = AGRIFOR + INDR + CONSTR + SERV + OTHERR$
11. $PCN = (DISPINC - PROFITN) + D(PRICE)$
12. $FCNPRIV = FIDONG + (GDPR(-1)*PFDP(-1)/100)$
13. $CHINVN = CHINVN(-1) + GDPN$
14. $GCFN = FCNPRIV + GCFEXP + CHINVN$
15. $LOG(IMN/IMN_RES) = LOG(PCN + GCFN + EXN)$
16. $EXOILN = OILVOL*POILS*EROFF/1000$
17. $LOG(EXOTHN)/PEX/EXOTHN_RES = LOG(PARTNERGDP_NEW*REER) + (@TREND)$
18. $EXN = EXOTHN + EXOILN$
19. $LOG(STCEXP) = LOG(REVTOTAL) + LOG(STCEXP(-1))$
20. $GDPN = PCN + STCEXP + GCFN + EXN - IMN$
21. $M2 = NFA + NDC$
22. $RB = M2/PRICE$
23. $LOG(PRICE) = LOG(PIM) + LOG(PGDP)$
24. $LOG(PGDP) = LOG((M2(-1)/PRICE(-1)*(GDPN/GDPR)) + LOG(GDPN(-1)/GDPR(-1))$
25. $LOG(PEX) = LOG(PIM(-1)) + LOG(PGDP) + DLOG(EROFF*POILS*AGRIPRICES)$
26. $LOG(GRWAGNPP/GRWAGNPP_RES) = LOG(PRICE(-1) + LOG(GDPR(-1)/LABOR(-1))$
27. $LABOR = LABOR(-1) + TREND$
28. $LOG(SOCSECN) = LOG(GRWAGNPP*LABOR)$
29. $TRANSFN = PRICE(-1) + TRANSFN(-1)$
30. $DISPINC = (GRWAGNPP*LABOR) - INCTAXN - SOCSECN + TRANSFN + PROFITN$
31. $TAXDIRN = INCTAXN + TAXPROFITN$
32. $LOG(INCTAXN) = LOG(GRWAGNPP*LABOR) + D96_98$
33. $TAXPROFITN = GDPN + D98$
34. $TAXINDN = TAXOILN + TAXTRADEN + TAXINDOTHN$
35. $TAXOILN/TAXEOILN_RES = EXOILN$
36. $LOG(TAXTRADEN) = LOG(IMN) + D97_98$

37. $TAXINDOTHN = (PCN + STCEXPEN) + D98$
38. $TAXN = TAXDIRN + TAXINDN$
39. $DEPRN = TREND$
40. $REVTOTAL = TAXN + SOCSECN + DEPRN + OTHREVN$
41. $EXPTOTAL = STCEXPEN + GCFEXPEN + TRANSFN_ALL + INTEXPEN + GREXPEN$
42. $DEFICITN = REVTOTAL - EXPTOTAL$

The list of variables in the model

Variables	Name	Specification
GDPN	Gross Domestic Product	Nominal
GDPR	Gross Domestic Product	Real
INDR	Industry	Real
CONSTR	Construction	Real
AGRIFOR	Agriculture, Forestry and Fishery	Real
SERV	Services	Real
TRANSCOR	Transport and Communication	Real
TRADER	Trade	Real
BANKINSR	Banking and Insurance	Real
STEDHER	State, Education and Health	Real
OTHERR	Other items	Real
PCN	Private Consumption	Nominal
STCN	State Consumption	Nominal
GCFN	Gross Capital Formation	Nominal
GCFEXPEN	Public Investment	Nominal
FCNPRIV	Private Investment	Nominal
FCN	Fixed capital	Nominal
CHINVN	Change in Inventories	Nominal
EXN	Export	Nominal
EXOILN	Oil export	Nominal
EXAGRIN	Export of agricultural products	Nominal
IMN	Import	Nominal
PIM	Price Index Imports	Index
PEX	Price Index Exports	Index
POIL\$	Price of Oil	Price
OILVOL	Volume of Oil exports	Index
EROFF	Exchange rate VND/Dollar (official)	Nominal
ERREAL\$	Exchange rate (real) to US dollar	Index
REER	Real effective exchange rate	
AGRIPRICES	Price of Agricultural raw materials	Index
FIDONG	Foreign Investment in Dong	Nominal
FIDONGR	Foreign Investment in Dong	Real
KIFIDONGR	Cumulated Foreign Investment in Dong	Real
PARTNERGDP_NEW	Foreign Demand	
NDA	Net Domestic Assets	Nominal
NFA	Net Foreign Assets	Nominal
M2	Broad Money	Nominal
PRICE	Price level	Index, 1994=100
PGDP	GDP – Deflator	GDP/GDPR
RB	Real Money Balance	M2/PRICE
DISPINCEN	Disposable Income	Nominal

GRWAGINC	Gross Wage Income	Nominal
GRWAGNPP	Gross Wage Income per capita	Nominal
Variables	Name	Specification
LABOR	Labour Force	Nominal
PROFITN	Profits	Nominal
STCEXP	State Consumption	Nominal
INTEXPN	Interests (Expenditure Side)	Nominal
GRANTSN	Current Transfer	Nominal
GREXP	Property Transfer (Expenditure Side)	Nominal
GCFEXP	Gross Capital Formation (State)	Nominal
SOCSECN	Social Security Contribution	Nominal
OTHREVN	Other revenues	Nominal
GREVN	Property Transfer (Revenue Side)	Nominal
DEPRN	Depreciation	Nominal
INCTAXN	Income Tax	Nominal
TRANSFERN	Transfer from Budget	Nominal
TAXN	Taxes	Nominal
TAXDIRN	Direct Taxes	Nominal
TAXPROFITN	Taxes on Profits	Nominal
TAXINDN	Indirect Taxes	Nominal
TAXTRADEN	Taxes on Trade	Nominal
TAXINDOTHN	Other Indirect Taxes	Nominal
TAXOILN	Taxes on Oil Export	Nominal
REVTOTAL	Total Budget Revenues	Nominal
EXPTOTAL	Total Budget Expenditure	Nominal
PGDP	Gross Domestic Product Deflator	Nominal

APPENDIX 4.2

The Fukase and Martin (1999) model

Experimental Design

Scenario 1 (AFTA1): Inclusion List (IL) and Temporary Exclusion List (TEL) liberalisation under AFTA (2003 for ASEAN-5 and 2006 for Vietnam). Vietnam liberalises the items in the IL and TEL. ASEAN-5 members reciprocate the concessions.

Scenario 2 (AFTA2): Scenario 1 plus Sensitive List (SL) liberalisation (2010 for ASEAN-5 and 2013 for Vietnam). Vietnam liberalises the items in the IL, TEL, SL and ASEAN-5 members reciprocate the concessions.

Scenario 3 (AFTA3): Scenario 2 plus General Exception List (GEL) liberalisation. Vietnam liberalises, as a counterfactual, the items in the IL, TEL, SL and GEL. The ASEAN-5 members reciprocate the concessions.

Scenario 4 (UNILATERAL): Scenario 3 plus unilateral tariff reduction on a non-discriminatory basis. What happens if Vietnam extends its AFTA concessions to the rest of the world is investigated. It is assumed that the other APEC members maintain the current protections.

Scenario 5 (APEC): All the APEC members, including Vietnam, reduce their tariff rates unilaterally to 2.5 per cent on a non-discriminatory basis.

*Results of Experiment***Table A4.2.1: Effects on Output**
(in percent)

	Scenario 1 AFTA 1	Scenario 2 AFTA 2	Scenario 3 AFTA 3	Scenario 4 UNILATERAL	Scenario 5 APEC
Agriculture and forestry	-0.1	0.2	0.3	-1.9	-4.0
Processed agriculture	-1.2	7.8	8.7	2.5	-22.7
Beverage and tobacco	-0.1	-1.0	-47.0	-55.0	-53.8
Coal, oil, gas	-0.1	-0.3	1.4	0.5	1.2
Petroleum products	5.0	5.0	5.8	7.1	13.8
Textiles	2.6	0.2	1.7	10.3	16.4
Apparel	10.1	6.9	7.9	75.4	83.9
Light manufacturing	4.2	1.9	3.3	15.6	28.0
Basic manufacturing	-3.6	-4.6	-3.7	-12.8	-10.9
Chemical, rubber, plastics	-0.4	-1.0	-1.0	-2.6	0.1
Transport equipment	-0.8	-2.6	-31.5	-48.1	-54.2
Electronics and machinery	-3.6	-4.7	-2.8	-7.5	-5.2

Source: Fukase and Martin (1998) – Table 5

Table A4.2.2: Real Returns to Factors of Production

(in percent)

	Scenario 1 AFTA 1	Scenario 2 AFTA 2	Scenario 3 AFTA 3	Scenario 4 UNILATERAL	Scenario 5 APEC
Land	1.9	4.0	9.9	2.9	-8.3
Unskilled labour	2.3	2.7	8.0	16.1	17.2
Skilled labour	2.0	2.4	7.7	15.4	17.7
Capital	2.0	2.4	7.2	14.3	16.0

Source: Fukase and Martin (1998) – Table 6

Table A4.2.3: The Effects of Terms of Trade

(in percent)

	Scenario 1 AFTA 1	Scenario 2 AFTA 2	Scenario 3 AFTA 3	Scenario 4 UNILATERAL	Scenario 5 APEC
World price effect	0.0	0.0	0.0	-0.01	0.01
Export price effect	-0.2	0.4	-0.4	-0.7	-2.6
Import price effect	0.02	0.02	0.05	0.02	-1.1
Total TOT effects	-0.2	0.4	-0.4	-0.7	-1.5

Source: Fukase and Martin (1998) – Table 7

Table A4.2.4: Key Economy-wide Variables for Vietnam

	Scenario 1 AFTA 1	Scenario 2 AFTA 2	Scenario 3 AFTA 3	Scenario 4 UNILATERAL	Scenario 5 APEC
Total import value (%)	3.1	3.4	6.3	12.8	11.7
From ASEAN	32.8	33.4	63.3	22.8	27.0
From ROW	-12.3	-12.1	-23.1	7.5	3.9
Total export value (%)	3.9	4.7	7.2	15.2	12.7
To ASEAN	13.8	33.6	36.9	33.8	-2.6
To ROW	2.3	0.1	2.5	12.2	15.2
Tariff revenue (%)	-18.0	-17.8	-56.0	-82.4	-84.7
Real expenditure (%)	0.02	0.4	-0.04	1.4	1.3
Total Equivalent Variation (US\$mil.) of which:	2.1	51.3	-5.6	191.6	180.3
Allocative component	19.2	21.7	26.6	251.0	293.3
Terms of trade component	-17.1	29.6	-32.3	-59.4	-113.0

Source: Fukase and Martin (1998) – Table 8

APPENDIX 4.3

The Ianchovichina et al. (2000) model

Results of Experiment

Table A4.3.1: Changes in Vietnam's Exports and Imports
(in percent)

	Export changes				Import changes	
	To the US		To the world		From the world	
	%	US\$mil.	%	US\$mil.	%	US\$mil.
Agriculture and forestry	-3	-4	-4	-42	5.0	5
Processed agriculture	16	8	-4	-38	3.0	13
Beverage and tobacco	120	1	14	0.5	2.9	10
Coal, oil, gas	4	3	-1	-9	-0.2	-1
Textiles	230	0.4	-4	-6	11.2	86
Clothing	1455	345	33	271	15.9	6
Light manufacturing	140	20	-6	-51	4.6	11
Basic manufacturing	314	3	-3	-3	1.0	9
Chemical, rubber, plastics	62	11	13	9	0.5	7
Electronics and machinery	276	1	-5	-4	3.0	61
Total	88	378	0	14	2.8	230

Source: Fukase and Martin (1999) – Table 7-8.

Table A4.3.2: Changes in Output
(in percent)

	Vietnam	USA
Agriculture and forestry	-1.0	0
Processed agriculture	-3.1	0
Beverage and tobacco	-2.3	0
Coal, oil, gas	-0.7	0
Textiles	4.5	-0.03
Clothing	27.3	-0.14
Light manufacturing	-5.0	0.01
Basic manufacturing	-1.9	0
Chemical, rubber, plastics	-1.0	0
Electronics and machinery	-1.6	0

Source: Fukase and Martin (1999) – Table 9.

Table A4.3.3: Key Economy-wide Variables for Vietnam

	Elasticity standard		Elasticity minus 50%		Elasticity plus 50%	
	Vietnam	USA	Vietnam	USA	Vietnam	USA
Export value (%)	-0.4	0.005	1.2	0.013	5.4	0.04
Export price	1.4	-0.002	1.3	-0.005	2.5	-0.005
Export volume	-1.8	0.006	-0.09	0.015	2.8	0.04
Price index (%)	2.1	-0.002	2.0	-0.003	3.9	-0.008
Real income per capita (%)	0.3	0.0	0.5	0.0	1.4	0.003
Total Equivalent Variation (US\$mil.) of which:	138	-3	164	48	374	157
Allocative component	23	19	55	75	162	225
Terms of trade component	115	-22	109	-27	212	-68
Tariff revenues (US\$mil.)	-5	-16	27	3	132	60

Source: Fukase and Martin (1999) – Table 10.

Table A4.3.4: Changes in Vietnam's Exports to the US – Sectoral Sensitivity Analysis (in percent)

	Elasticity standard	Elasticity minus 50%	Elasticity plus 50%
Agriculture and forestry	-3	-3	-8
Processed agriculture	16	8	16
Beverage and tobacco	120	48	292
Coal, oil, gas	4	1	5
Textiles	230	82	458
Clothing	1455	296	5074
Light manufacturing	140	55	227
Basic manufacturing	314	103	657
Chemical, rubber, plastics	62	27	96
Electronics and machinery	276	94	553

Source: Fukase and Martin (1999) – Table 11.

APPENDIX 5.1

The Mundell-Fleming Model

1. Goods Market

$$Y + RQ = C + I + G + X \quad \text{goods market equilibrium} \quad (\text{A5.1.1})$$

$$C = C(Y) \quad 0 < C_Y < 1 \quad \text{consumption} \quad (\text{A5.1.2})$$

$$I = I(i) \quad I_i < 0 \quad \text{investment} \quad (\text{A5.1.3})$$

$$Q = Q(Y, R) \quad Q_Y > 0; Q_R < 0 \quad \text{imports} \quad (\text{A5.1.4})$$

$$X = X(Y^*, R) \quad X_{Y^*} > 0; X_R > 0 \quad \text{exports} \quad (\text{A5.1.5})$$

2. Money Market

$$\frac{M^d}{P} = L(Y, i) \quad L_Y > 0; L_i < 0 \quad \text{money demand} \quad (\text{A5.1.6})$$

$$M^s = M^d = M \quad \text{money market equilibrium} \quad (\text{A5.1.7})$$

3. Foreign exchange market

$$BP = CA + CP = 0 \quad \text{balance of payments} \quad (\text{A5.1.8})$$

$$CA = PX - EP^*Q \quad \text{current account} \quad (\text{A5.1.9})$$

$$CP = K[i - i^* - E(\&)]K_i = -K_{i^*} = -K_{E(\&)} > 0 \quad \text{capital account} \quad (\text{A5.1.10})$$

Note: The signs or magnitudes of the (partial) derivatives with respect to the subscript are given next to the behavioural equations. Variables are defined as follows:

Y	domestic national income	M^d	money demand
Q	imports	M^s	money supply
C	consumption	M	money
I	investment	i	nominal interest rate
G	government spending	BP	balance of payments
X	exports	CA	current account
R	real exchange rate ($\equiv EP^*/P$)	CP	capital account
E	exchange rate	i^*	foreign interest rate
P	domestic price level	$E(\&)$	expected depreciation
P^*	foreign price level	Y^*	foreign national income

Mathematical Solution of the MF Model under a Flexible Exchange Rate

The goods market equilibrium, or IS curve, for the domestic economy is rearranged from equation (A5.1.1) and given by:

$$Y = D = A(i, Y) + T(e, Y) + G \quad (\text{A5.1.11})$$

where A stands for domestic absorption or spending ($A = C + I$), T denotes the surplus on current account ($T = X - Q$), G is autonomous government spending.

$$\partial A / \partial Y = 0 < A_y < 1; \partial A / \partial i = A_i < 0; \partial T / \partial e = T_e > 0; \partial T / \partial Y = T_y < 0.$$

$$\text{The slope of the IS curve: } di / dY = (1 - A_y - T_y) / A_i < 0 \quad (\text{A5.1.12})$$

The LM schedule equilibrium in the monetary market is given by equation (A5.1.6). Setting $\partial L / \partial Y = L_y > 0$; $\partial L / \partial i = L_i < 0$.

$$\text{The slope of the LM curve: } di / dY = -L_y / L_i > 0 \quad (\text{A5.1.13})$$

The BP schedule, which is the equilibrium in the foreign exchange market, is given by the current and capital accounts of the balance of payments:

$$B = T(e, Y) + K(i) = 0 \quad (\text{A5.1.14})$$

where $T_y < 0$; $T_e > 0$; and $K_i = \infty$ means the assumption of perfect capital mobility.

$$\text{The slope of the BP curve: } di / dY = -T_y / K_i = 0 \quad (\text{A5.1.15})$$

The results of totally differentiating equation (A5.1.11), (A5.1.6) and (A5.1.14), respectively are obtained as follows:

$$(1 - A_y - T_y)dy - A_i di - T_e de = dG$$

$$L_y dy + L_i di = dM$$

$$T_e de + T_y dy + K_i di = 0$$

These three equations can be rearranged in matrix form:

$$\begin{bmatrix} L_y & L_i & 0 \\ (1 - A_y - T_y) & -A_i & -T_e \\ T_y & K_i & T_e \end{bmatrix} \begin{bmatrix} dY \\ di \\ de \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \\ 0 & 0 \end{bmatrix} \begin{bmatrix} dM \\ dG \end{bmatrix}$$

The determinant is given by:

$$\Delta = T_e [L_y (K_i - A_i) - L_i (1 - A_y)] > 0 \quad (\text{A5.1.16})$$

A Monetary Expansion Policy (a rise in M)

The money multipliers are derived from the above equations as follows:

$$\frac{dY}{dM} = \frac{Te(Ki - Ai)}{\Delta} > 0 \quad (\text{A5.1.17}); \quad \text{if } Ki \rightarrow \infty \text{ hence } \frac{dY}{dM} = \frac{1}{Ly} \quad (\text{A5.1.18})$$

$$\frac{di}{dM} = \frac{-Te(1 - Ay)}{\Delta} < 0 \quad (\text{A5.1.19}); \quad \text{if } Ki \rightarrow \infty \text{ hence } \frac{di}{dM} = 0 \quad (\text{A5.1.20})$$

$$\frac{de}{dM} = \frac{Ki(1 - Ay - Ty) + AiTy}{\Delta} > 0 \quad (\text{A5.1.21})$$

if $Ki \rightarrow \infty$, in equilibrium $i = i^*$ and if i^* is fixed, then $di = di^* = 0$ and $Ai = 0$; $Li = 0$. The determinant given by (A5.1.16) reduces to: $\Delta = TeLyKi$

$$\text{Then } \frac{de}{dM} = \frac{(1 - Ay - Ty)}{TeLy} > 0 \quad (\text{A5.1.22})$$

An Expansionary Fiscal Policy (a rise in G)

$$\frac{dY}{dG} = \frac{-Li}{Ly(Ki - Ai) - Li(1 - Ay)} > 0 \quad (\text{A5.1.23})$$

$$\text{if } Ki \rightarrow \infty \text{ hence } \frac{dY}{dG} = 0 \quad (\text{A5.1.24})$$

$$\frac{di}{dG} = \frac{Ly}{Ly(Ki - Ai) - Li(1 - Ay)} > 0 \quad (\text{A5.1.25})$$

$$\text{if } Ki \rightarrow \infty \text{ hence } \frac{di}{dG} = 0 \quad (\text{A5.1.26})$$

$$\frac{de}{dG} = \frac{LiTy - LyKi}{\Delta} > 0 \quad (\text{A5.1.27})$$

$$\text{if } Ki \rightarrow \infty \text{ hence } \frac{de}{dG} = \frac{-1}{Te} < 0 \quad (\text{A5.1.28})$$

Mathematical Solution of the MF Model under a Fixed Exchange Rate

In the case of a fixed exchange rate regime, money supply is an endogenous variable which consists of two components:

$$M = C + F \quad (\text{A5.1.29})$$

where C is the domestic component of the money supply, F is foreign exchange reserves which change with the balance of payments and hence $dF = dB$. Now the model equations can be represented as follows:

$$(1 - Ay - Ty)dy - Aidi = Tede + dG \quad (\text{A5.1.30})$$

$$Lydy + Lidi - dF = dC \quad (\text{A5.1.31})$$

$$Tydy + Kidi - dB = Tede \quad (\text{A5.1.32})$$

where the fixed exchange rate means $de = 0$. These three equations can be rearranged in matrix form:

$$\begin{bmatrix} Ly & Li & -1 \\ (1 - Ay - Ty) & -Ai & 0 \\ Ty & Ki & -1 \end{bmatrix} \begin{bmatrix} dY \\ di \\ dB \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \\ 0 & 0 \end{bmatrix} \begin{bmatrix} dC \\ dG \end{bmatrix}$$

The determinant is given by:

$$\Delta = Ai(Ly - Ty) - (1 - Ay - Ty)(Ki - Li) < 0 \quad (\text{A5.1.33})$$

A Monetary Expansion Policy (a rise in M)

$$\frac{dY}{dC} = \frac{Ai}{\Delta} > 0 \quad (\text{A5.1.34}); \quad \text{if } Ki \rightarrow \infty \text{ hence } \frac{dY}{dC} = 0 \quad (\text{A5.1.35})$$

$$\frac{di}{dC} = \frac{1 - Ay - Ty}{\Delta} < 0 \quad (\text{A5.1.36}); \quad \text{if } Ki \rightarrow \infty \text{ hence } \frac{di}{dC} = 0 \quad (\text{A5.1.37})$$

$$\frac{dB}{dC} = \frac{dF}{dC} = \frac{Ki(1 - Ay - Ty) + AiTy}{\Delta} < 0 \quad (\text{A5.1.38})$$

$$\text{if } Ki \rightarrow \infty, \quad \text{then } \frac{dB}{dC} = -1 \quad (\text{A5.1.39})$$

An Expansionary Fiscal Policy (a rise in G)

$$\frac{dY}{dG} = \frac{-Ki + Li}{\Delta} > 0 \quad (\text{A5.1.40})$$

$$\text{if } Ki \rightarrow \infty \text{ hence } \frac{dY}{dG} = \frac{1}{1 - Ay - Ty} > 0 \quad (\text{A5.1.41})$$

$$\frac{di}{dG} = \frac{-Ly + Ty}{\Delta} > 0 \quad (\text{A5.1.42})$$

$$\text{if } Ki \rightarrow \infty \text{ hence } \frac{di}{dG} = 0 \quad (\text{A5.1.43})$$

$$\frac{dB}{dG} = \frac{LiTy - LyKi}{\Delta} > 0 \quad (\text{A5.1.44})$$

$$\text{if } Ki \rightarrow \infty \text{ hence } \frac{dB}{dG} = \frac{Ly}{1 - Ay - Ty} > 0 \quad (\text{A5.1.45})$$

APPENDIX 5.2

The Dornbusch Model

1. Goods Market

$$\dot{\pi} = \pi(y^d - y) \quad \text{Philips curve} \quad (\text{A5.2.1})$$

$$y^d = \delta(e - p) + \gamma y - \sigma i + g \quad \text{aggregate demand} \quad (\text{A5.2.2})$$

2. Money Market

$$m^d = p + \phi y - \lambda i \quad \text{money demand} \quad (\text{A5.2.3})$$

$$m^s = m^d = m \quad \text{money market equilibrium} \quad (\text{A5.2.4})$$

3. International asset market

$$i = i^* + E(\dot{\pi}) \quad \text{asset market equilibrium} \quad (\text{A5.2.5})$$

$$E(\dot{\pi}) = \theta(\bar{e} - e) \quad \text{expectations formation} \quad (\text{A5.2.6})$$

Note: Lower-case variables are in natural logarithms, an exception being the interest rate. A dot indicates the change of the respective variable over time. Greek letters denote positive parameters. $E(.)$ is the expectations operator. Variables are defined as follows:

π	domestic inflation rate	i	domestic interest rate
y^d	aggregate demand for domestic goods	i^*	foreign interest rate (exogenous)
y	aggregate supply of domestic goods (exogenous)	m	domestic money
e	exchange rate	δ	rate of depreciation
p	domestic price level	\bar{e}	equilibrium exchange rate
g	government expenditure	m^s	domestic money supply
		m^d	domestic money demand

Substituting (A5.2.5) into (A5.2.6) and then (A5.2.6) into (A5.2.3), rearranging we obtain:

$$p = m - \phi y + \lambda i^* - \lambda \theta(\bar{e} - e) \quad (\text{A5.2.7})$$

In long run steady state the actual and equilibrium exchange rate will be equal ($e = \bar{e}$), hence the long run price level will be written in the form:

$$\bar{p} = m - \phi y + \lambda i^* \quad (\text{A5.2.8})$$

Inserting (A5.2.8) into (A5.2.7) solving for e we obtain the asset market equilibrium expressed in terms of deviation from long run equilibrium:

$$e - \bar{e} = (-1/\lambda\theta)(p - \bar{p}) \quad (\text{A5.2.9})$$

with a negative slope: $\partial e / \partial p = -1 / \lambda \theta$.

Goods market equilibrium is found by substituting (A5.2.2) into (A5.2.1) and then we obtain:

$$\bar{p} = \pi [\delta(e - p) + (\gamma - 1)y - \sigma i + g] \quad (\text{A5.2.10})$$

Substituting for i from (A5.2.3) into (A5.2.10), setting $\bar{p} = 0$ and rearrange we obtain the goods market equilibrium:

$$p = \frac{\lambda \delta}{\lambda \delta + \sigma} e + \frac{\sigma}{\lambda \delta + \sigma} m - \frac{\lambda(1 - \gamma) + \sigma \phi}{\lambda \delta + \sigma} y + \frac{\lambda}{\lambda \delta + \sigma} g \quad (\text{A5.2.11})$$

where $0 < \partial p / \partial e < 1$.

In the long run, when $i = i^*$, $\bar{p} = 0$, $E(\bar{p}) = 0$ and substitution of (A5.2.2) into (A5.2.1) we obtain the $\bar{p} = 0$ schedule with unity slope, implying a constant real exchange rate (the PPP line):

$$p = e - \frac{(1 - \gamma)y}{\delta} + \frac{g}{\delta} - \frac{\sigma i^*}{\delta} \quad (\text{A5.2.12})$$

By equating (A5.2.11) and (A5.2.12) we obtain the exchange rate at which both the $\bar{p} = 0$ schedule and the goods market intersect:

$$\bar{e} = m - \phi y + \frac{1 - \gamma}{\delta} y - \frac{g}{\delta} + (\lambda + \frac{\sigma}{\delta}) i^* \quad (\text{A5.2.13})$$

From (A5.2.12) and (A5.2.9), the long run neutrality of money, that is $d\bar{e} / d\bar{p} = d\bar{p} / dm = d\bar{e} / dm = 1$, the long run PPP and the quantity theory of money hold.

However, in the short run the market equation (A5.2.9) holds continuously, and substituting for \bar{e} from (A5.2.13) and \bar{p} from (A5.2.8) yields:

$$e = (\frac{1}{\lambda \theta} + 1)y - \frac{1}{\lambda \theta} p + (\lambda + \frac{\sigma}{\delta} + \frac{1}{\theta}) i^* - (\phi + \frac{\gamma - 1}{\delta} + \frac{\phi}{\lambda \theta}) y - \frac{g}{\delta} \quad (\text{A5.2.14})$$

If p and y remain constant in the short run hence:

$$de / dm = d\bar{e} / dm + \frac{1}{\lambda \theta} = 1 + \frac{1}{\lambda \theta} > 1 \quad (\text{A5.2.15})$$

In the short run the exchange rate overshoots its long run equilibrium.

Dornbusch Model with Perfect Foresight Expectations

Perfect foresight expectations imply that the expected change in the exchange rate next period based on information available in this period is exactly the change which occurs. That is:

$$E(\dot{\mathcal{E}}) = \dot{\mathcal{E}} \quad \text{perfect foresight} \quad (\text{A5.2.16})$$

so that the UIP condition is:

$$i = i^* + \dot{\mathcal{E}} \quad \text{asset market equilibrium} \quad (\text{A5.2.17})$$

From the money market equation (A5.2.14) solving for i :

$$i = \frac{p - m}{\lambda} + \frac{\phi}{\lambda} y \quad (\text{A5.2.18})$$

Further solving for i^* in the long run price level \bar{p} in (A5.2.8):

$$i^* = \frac{\bar{p} - m}{\lambda} + \frac{\phi}{\lambda} y \quad (\text{A5.2.19})$$

Subtracting (A5.2.16) from (A5.2.15) obtains the change in the exchange rate as a deviation from its equilibrium value:

$$i - i^* = \dot{\mathcal{E}} = \frac{p - \bar{p}}{\lambda} \quad (\text{A5.2.20})$$

Next substituting (A5.2.3), (A5.2.8) and (A5.2.13) into (A5.2.10) we obtain the change in the exchange rate as deviations from their equilibrium value:

$$\dot{\mathcal{E}} = \pi \delta (e - \bar{e}) - \pi \left(\delta + \frac{\sigma}{\lambda} \right) (p - \bar{p}) \quad (\text{A5.2.21})$$

Equation (A5.2.20) and (A5.2.21) form a simultaneous first-order dynamic system that yields adjustment path for p and e , and can be represented by homogeneous matrix equation:

$$\begin{bmatrix} \dot{p} \\ \dot{\mathcal{E}} \end{bmatrix} = \begin{bmatrix} -\pi(\delta + \sigma/\lambda) & \pi\delta \\ 1/\lambda & 0 \end{bmatrix} \begin{bmatrix} p - \bar{p} \\ e - \bar{e} \end{bmatrix} = A \begin{bmatrix} p - \bar{p} \\ e - \bar{e} \end{bmatrix} \quad (\text{A5.2.22})$$

The eigenvalues of A are obtained from $|A - \theta I| = 0$ where I is the identity matrix, thus the characteristic equation of (A5.2.22) is given as:

$$\begin{vmatrix} -\pi(\delta + \sigma/\lambda) - s & \pi\delta \\ 1/\lambda & -s \end{vmatrix} = 0 \Rightarrow s^2 + \pi(\delta + \sigma/\lambda)s - \pi\delta/\lambda = 0$$

which has the following two solutions:

$$s_1, s_2 = -\frac{1}{2}\pi(\delta + \sigma/\lambda) \pm \frac{1}{2}\left[\pi^2(\delta + \sigma/\lambda)^2 + 4\pi\delta/\lambda\right]^{1/2} \quad (\text{A5.2.23})$$

Thus the two eigenvalues have opposite signs. The unique saddle-point path is given by the negative root (s_1), say. Hence the solution to equation (A5.2.22) is:

$$\bar{p} = s_1(p - \bar{p}) \quad (\text{A5.2.24})$$

$$\bar{e} = s_1(e - \bar{e}) \quad (\text{A5.2.25})$$

Equation (A5.2.24) may be used to show under what circumstances the simple regressive expectation scheme used in the simple DB may be rational. The expected change in the exchange rate in the simple DB was given by equation (A5.2.6): $E(\bar{e}) = \theta(e - \bar{e})$. With perfect foresight $E(\bar{e}) = \bar{e}$ and therefore it is clear from (A5.2.25) that θ must equal $-s_1$ for there to be no expectational errors. Hence with perfect foresight the parameter θ depends on all the model's structural parameters, as in (A5.2.23).

APPENDIX 5.3

The Portfolio Balance Model

Static Exchange Rate Expectations

Equations of the model are as follows:

$$W = M + B + eF^* \quad \text{wealth constraint} \quad (\text{A5.3.1})$$

$$M = m(i, i^* + E(\mathcal{E}))W \quad \text{money market equilibrium} \quad (\text{A5.3.2})$$

$$m_1 < 0 ; m_2 < 0$$

$$B = b(i, i^* + E(\mathcal{E}))W \quad \text{domestic bond market equilibrium} \quad (\text{A5.3.3})$$

$$b_1 > 0 ; b_2 < 0$$

$$eF^* = f(i, i^* + E(\mathcal{E}))W \quad \text{foreign bonds market equilibrium} \quad (\text{A5.3.4})$$

$$f_1 < 0 ; f_2 > 0$$

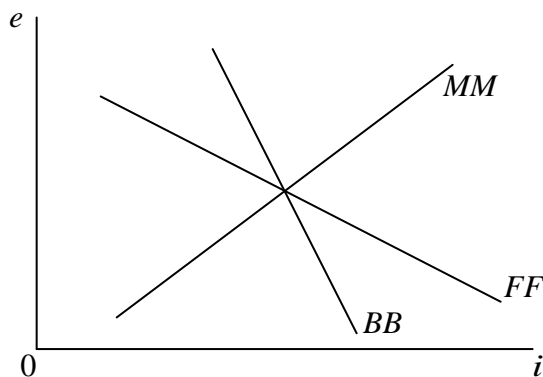
$$dF^* / dt = CAB = T(e / p, W, IM) + i^* F^* \quad \text{current account balance} \quad (\text{A5.3.5})$$

$$T_1 > 0 ; T_2, T_3 < 0$$

The asset market equilibrium conditions for each of these three assets are given as equations (A5.3.2), (A5.3.3) and (A5.3.4). The principal characteristic of these demand equations is that the scale variable is the level of wealth and that the demand functions are all homogeneous in wealth, which allows them to be written in nominal terms. The asset supplies are exogenous and fixed. Equation (A5.3.2) shows that money demand is inversely related to the yields on both domestic and foreign securities. Equation (A5.3.3) and (A5.3.4) indicate that domestic and foreign bond demands depend positively on the own rate of interest and negatively on the rate of interest on the other asset. The assets are assumed to be gross substitutes, so that $|b_1| > |f_1|$ and $|f_2| > |b_2|$. The case where the assets are perfect substitutes is given by, $f_1 = b_2 \rightarrow \infty$, in which case equation (A5.3.3) collapses to the uncovered interest rate parity condition and the financial sector of the model given by (A5.3.2) collapses to the money market equilibrium condition as in the MF model.

The short run exchange rate determination is diagrammatical presented in Figure A5.3.1. The three asset market equilibrium equations can be depicted in (e, i) space, for given levels of $i^* + E(\mathcal{E})$ and asset stocks, where the MM locus gives money market equilibrium. It has a positive slope, given by: $[de / di]_{MM} = -(Wm_1 / mF^*) > 0$.

Figure A5.3.1: The Short-run Determination of the Exchange Rate



A depreciation (rise) of the exchange rate raises the domestic currency value of foreign bonds, thereby increasing wealth, which results in the increase in the demand for domestic money. With the supply of domestic money fixed, the rise in the exchange rate will require a rise in the home rate of interest to maintain money market equilibrium.

Equilibrium in the domestic bond market is represented by the BB schedule, which is negatively sloped given by: $[de/di]_{BB} = -(Wb_1/bF^*) < 0$.

In this case, a depreciation of the exchange rate increases domestic wealth through a revaluation of domestic residents' holdings of foreign assets, which also causes an excess demand for bonds. However, given the existing number of domestic bonds, the increased demand for bonds is eliminated by a rise in the price of bonds and a fall in the rate of interest.

The FF line, representing the equilibrium in the market for foreign bonds, has a negative slope, given by: $[de/di]_{FF} = Wf_1/(1-f)F^* < 0$.

As the domestic rate of interest rises, the domestic demand for foreign bonds falls as domestic residents substitute domestic for foreign bonds in their portfolios. This must be offset by a fall in the domestic currency price of foreign assets, consequently there is an appreciation of the domestic currency. However, the FF line is flatter than the BB line on the assumption that a change in the domestic rate of interest will have a larger effect upon the domestic bond market than on the foreign bond market.

The intersection of the MM , BB and FF lines shown in Figure A5.3.1 gives the short-run equilibrium levels of the exchange rate and the domestic interest rate. In fact, because of the wealth constraint, only two of the three market equilibrium equations are

independent. Thus if a given change restores equilibrium in two markets, the third market must also be in equilibrium.

Dynamic Exchange Rate Expectations

Linearising equation (A5.3.5), with i^* assumed constant, gives a slope for $\dot{P}^* = 0$ of:

$$de / dF^* = -(eT_2 + i^*) / (T_1 + T_2 F^*) > 0 \quad (\text{A5.3.6})$$

Linearising equations (A5.3.2) and (A5.3.4) gives solutions for i and $\&$ with i^* constant:

$$\begin{bmatrix} eF^* / W \\ M / W \end{bmatrix} = \begin{bmatrix} f_1 & f_2 \\ m_1 & m_2 \end{bmatrix} \begin{bmatrix} i \\ \& \end{bmatrix} \quad (\text{A5.3.7})$$

which implies that:

$$\begin{bmatrix} i \\ \& \end{bmatrix} = [f_1 m_2 - m_1 f_2]^{-1} \begin{bmatrix} m_2 & -f_2 \\ -m_1 & f_1 \end{bmatrix} \begin{bmatrix} eF^* / W \\ M / W \end{bmatrix} \quad (\text{A5.3.8})$$

so that $\&$ is given by:

$$\& = \phi[(eF^* / W), (M / W)] \quad \text{where } \phi_1 > 0; \phi_2 < 0 \quad (\text{A5.3.9})$$

Linearising equations (A5.3.5) and (A5.3.9) gives the following second-order dynamic system:

$$\begin{bmatrix} \& \\ F^* \end{bmatrix} = \begin{bmatrix} \phi_1(F^* / W) & \phi_2(e / W) \\ (T_1 + T_2 F^*) & (eT_2 + i^*) \end{bmatrix} \begin{bmatrix} e \\ F^* \end{bmatrix} + \begin{bmatrix} \phi_1(M / W) \\ T_2(M + B) + T_3 IM \end{bmatrix} \quad (\text{A5.3.10})$$

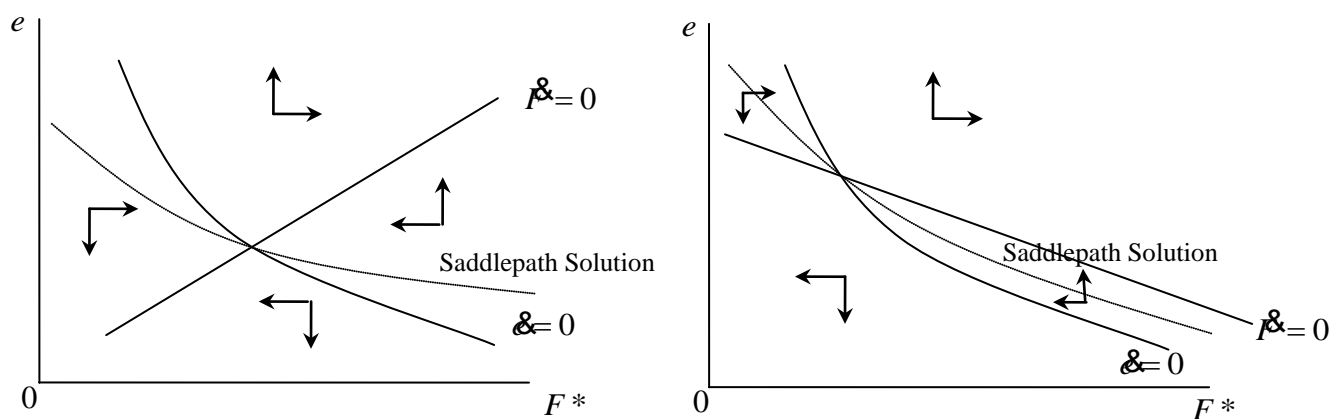
Saddlepath equilibrium requires that the determinant of the 2x2 matrix be negative. This is unambiguously the case if $eT_1 > i^* F^*$; that is, if the wealth effect on the trade balance exceeds the foreign interest rate effect.

In the long run steady-state equilibrium the current account must be in balance ($\dot{P}^* = 0$). From Equation (A5.3.6) the $\dot{P}^* = 0$ schedule may have either a positive or negative slope. The denominator of the equation will be positive if the Marshall-Lerner condition holds, although the numerator can be either positive or negative, depending upon the relative size of eT_2 and i^* . If eT_2 is large relative to i^* , then the $\dot{P}^* = 0$ line has a positive slope. This implies that significant changes in wealth are spent on foreign goods, which causes the trade balance to deteriorate and the exchange rate to depreciate. If, on the

other hand, any increase in domestic residents' wealth is only spent on domestic goods, then $T_2 = 0$, and the $\dot{F}^* = 0$ line has a negative slope. However, in the case of the $\dot{F}^* = 0$ line having a negative slope, stability only occurs when the $\dot{F}^* = 0$ curve is flatter than the $\dot{e} = 0$ curve in the neighbourhood of the intersection. This is represented in the form of a phase-diagram in Figure A5.3.2.

The slope of the $\dot{e} = 0$ schedule is a rectangular hyperbola since e and F^* enter (A5.3.8) multiplicatively (in both eF^* and in W), and change in e and F^* which keep eF^* constant will also keep \dot{e} constant. From equation A4.4.9 a rise in e or F^* will lead to a depreciation of the exchange rate.

Figure 5.3.2: Equilibrium in the PBM with perfect foresight



APPENDIX 6.1

Definitions and Sources of Variables Used in the Model

No	Variables		Sources	Definition of Variables
	Endogenous Variables	Exogenous Variables		
1	Aggregate demand for output (y^d)		GSO	GDP in billion Dong at current prices
2	Private consumption (c^p)		GSO	Private consumption expenditure in billion Dong at current prices
3	Total private investment (i)		GSO	Total investment capital of society in billion Dong at current prices
4		Government consumption (c^g)	GSO, IMF, WB	Government consumption expenditure in billion Dong at current prices
5	Government investment (i^g)		GSO, IMF, WB	Government capital expenditure in billion Dong at current prices
6	Public capital stock ($i^g = k^g$)		GSO, IMF, WB	Calculated from government capital expenditure
7	Total exports (tx)		GSO	Value of exports in million US dollars
8	Total imports (tm)		GSO	Value of imports in million US dollars
9	SOE investment (i^e)		GSO	Investment capital from state sector in billion Dong at current prices
10	Private investment (i^p)		GSO	Investment capital from non-state sector in billion Dong at current prices
11	Foreign asset stock (f)		IMF, WB	Net foreign assets in billion Dong at current price
12	SOE capital stock ($i^e = k^e$)		GSO	Calculated from investment capital from state sector
13	Private capital stock (k^p)		GSO	Calculated from investment capital from non-state sector
14	Aggregate supply of output (y^s)		GSO	Proxied by GDP at current prices due to the unavailability of GDP at current factor cost.
15	Domestic nominal wage (w)		GSO	Proxied by the ratio between total national income and total employed labour force
16	Domestic price level (p)		IMF, WB	Measured by price index
17	Private real wealth (w^p)		GSO	Private real wealth is not available. Hence to obtain this data, it is proxied by the total of foreign asset, broad money and private capital stock

18	Domestic nominal interest rate (r)		IMF	Measured by short term lending interest rate
19	Real profits (R)			The data is not available. Hence the parameter is derived from existing studies
20	Tobin's q ratio (q)			The data is not available. Hence the parameter is derived from existing studies
21	Nominal money supply (m)		IMF, WB	Measured by broad money M2
22	Current account balance (f)		GSO, IMF, WB	Current account balance of payments in million \$US
23		Nominal exchange rate (e)	GSO, IMF, WB	Defined as the nominal exchange rate of the Vietnamese Dong against the US dollar. An increase in the exchange rate means a nominal depreciation of the Vietnamese Dong.
24		World real income (y^*)	IMF (IFS)	Proxied by real GDP in millions of US dollars for ten major trading partners with Vietnam (Japan, Singapore, China, Australia, Taiwan, Germany, USA, Indonesia, Philippines, and UK)
25		World price level (p^*)	IMF (IFS)	Proxied by USA's CPI
26		World nominal interest rate (r^*)	IMF (IFS)	Proxied by USA's deposit interest rate
27	Inflation expectation (π)		IMF, WB	Calculated from the domestic price level (lagged one period)
28		Trade protection (import and export tariffs) (T)		The data is not available. Hence the parameter is derived from existing studies

APPENDIX 6.2

Iterative Cochrane-Orcutt Procedures

The steps for carrying out the Cochrane-Orcutt procedure are as follows:

Step 1 Estimate equation $y_t = \alpha + \beta x_t + u_t$ by OLS computes its residuals \hat{u}_t .

Step 2 Estimate the first-order serial correlation coefficient (call it $\hat{\rho}$) from equation

$$\hat{\rho} = \sum \hat{u}_t \hat{u}_{t-1} / \sum \hat{u}_t^2.$$

Step 3 Transform the variables as follows: $Y_t^* = Y_t - \hat{\rho}Y_{t-1}$, $X_t^* = X_t - \hat{\rho}X_{t-1}$, and $\alpha^* = \alpha(1 - \hat{\rho})$.

Step 4 Regress Y_t^* on X_t^* and get OLS estimates of the transformed equation:

$$Y_t^* = \alpha^* + \beta X_t^* + \varepsilon_t.$$

Step 5 Use the estimates for the coefficients in Step 1 and obtain a new set of estimates of u_t . Then go back and repeat Step 2 with these new values until the following stopping rule applies.

Step 6 This iterative procedure can be stopped when the estimates of ρ from two successive iterations differ by no more than some preselected value, such as 0.001. The final $\hat{\rho}$ is then used to get the CORC estimates from the transformed equation.

APPENDIX 6.3

The Dickey-Fuller Unit Root Test

For the Dickey-Fuller test, a straightforward procedure is to test for $\rho = 1$ (the so-called *unit root test*) in the autoregressive equation $y_t = \rho y_{t-1} + \varepsilon_t$, in which the dependent variable is expressed as a deviation from its mean so that there is no constant term in the model. The error terms ε_t are assumed to be white noise and the first observation y_t is assumed to be fixed. This test is based on the estimation of an equivalent regression equation, namely:

$$\Delta y_t = \delta y_{t-1} + \varepsilon_t \quad (\text{A6.3.1})$$

The DF test consists of testing the negativity of δ in the ordinary least squares regression of (A6.3.1). Rejection of the null hypothesis ($\delta = 0$) in favour of the alternative ($\delta < 0$) implies that $\rho < 1$ and that y_t is integrated of order zero ($y_t \sim I(0)$)⁶³. In the case where the null hypothesis cannot be rejected the variable y_t might be integrated of order higher than zero. Consequently, the next step would be to test whether the order of integration is one. If $y_t \sim I(1)$, then $\Delta y_t \sim I(0)$. Hence the test can be repeated using Δy_t instead of y_t . The process is continued until an order of integration for y_t is established.

The DF test can also be used for testing the order of integration for a variable generated as a stochastic process with drift, that is by tests of the equation

$$\Delta y_t = \mu + \delta y_{t-1} + \varepsilon_t \quad (\text{A6.3.2})$$

where μ is a constant representing drift. The technique is analogous to that described before, but the distribution of the t -statistic for δ is different and consequently different tables of critical values should be used. In practice it is unclear when one should use this test, and when one should use the DF test without a constant. Experience suggests that tests with the constant term sometimes give unexpected results that are hard to interpret.

A modification of the DF equation which accounts for both drifts and a linear deterministic trend is based on the estimation of a regression of the following equation:

• ⁶³ For testing integration the Student- t statistics are in the DF table. However the DF table has been considerably extended by MacKinnon (1991) through Monte Carlo simulations.

$$\Delta y_t = \mu + \alpha t + \delta y_{t-1} + \varepsilon_t \quad (\text{A6.3.3})$$

In this equation it is possible to test simultaneously for the absence of a stochastic trend ($\delta < 0$) and the existence of a deterministic trend ($\alpha \neq 0$).

A weakness of the original DF test is that it does not take account of possible autocorrelation in the error process ε_t . If ε_t is autocorrelated (that is, it is not white noise) then the ordinary least squares estimates of the equation and its variants are not efficient. A simple solution is to use lagged left-hand side variables as additional explanatory variables to approximate the autocorrelation. This test, called the Augmented Dickey-Fuller (ADF) test, is widely regarded as being the most efficient test from among the simple tests for integration and is at present the most widely used in practice. The ADF auxiliary equation which accounts for both drift and a linear deterministic trend is:

$$\Delta y_t = \mu + \alpha t + \delta y_{t-1} + \sum_{i=1}^{k \max} \phi_i \Delta y_{t-i} + \varepsilon_t \quad (\text{A6.3.4})$$

where $k \max$ is the maximum lag length chosen *a priori* for the lagged differenced variable. The practical rule for establishing the value of k is that it should be relatively small in order to save degrees of freedom, but large enough to allow for the existence of autocorrelation in ε_t . There are a number of ways to evaluate the appropriate lag length, k . The standard model specification criteria, such as, Akaike Information Criterion (AIC), and Schwartz Bayesian Criterion (SBC) are often used to determine k .

APPENDIX 7.1

Dynamic stability properties of the model

The model presented in Chapter 5 assumes that economic agents possess rational expectations. Therefore, this model is characterised by a stable saddlepath property, in which long-run equilibrium can only be achieved if the economy is on the relevant stable saddlepath. It has variables which can be characterised as being either predetermined (non-jump) or non-predetermined (jump). The latter variables are required to make discrete jumps, arising from shocks, in order to instantaneously put the economy on its new stable saddlepath, which will ultimately take the economy to its long-run steady state.

Two exchange rate versions of the model used in the simulation in Chapter 7 have been emphasised, each of which, to be stable, must exhibit dynamic properties which are consistent with their underlying behavioural properties. Each version of the model has dynamic equations covering a set of endogenous control variables. In the fixed exchange rate version, only Tobin's q ratio is capable of jumping on impact following an exogenous shock, while in the flexible exchange rate version, it is assumed that there are two non-predetermined variables, that is Tobin's q and the real exchange rate, since the nominal exchange rate is now perfectly flexible and capable of adjusting on impact.

Either version of the model can be generalised to the following linear approximation of deviations about equilibrium values:

$$Dx = Ax' + Bz$$

where (x) represents a vector of the endogenous control variables and (Dx) is its time derivative, (z) is a vector of the exogenous variables and (x') denotes the deviation of x around its equilibrium value. (A) and (B) are parameter matrices.

The dynamic stability of the model depends on the properties of the 'state' matrix (A) . A complete algebraic analysis of the model's stability, based on the respective characteristic equations of matrix (A) , is complex and does not produce analytically unambiguous results. However, for stability, the determinant of (A) should be of a particular sign for each version of the model. In the fixed exchange rate model, only one control variable is capable of making discrete jumps, and is associated with a positive and unstable root, while the remainder are predetermined and associated with negative and

stable roots. Hence, the determinant of (A) , which gives the product of the roots for the fixed exchange rate case, must be positive. If this is not satisfied, then the model will be unstable, with the dynamics of adjustment being inconsistent with the underlying assumption of the model.

In the flexible exchange rate model, two of the control variables are assumed capable of making discrete jumps, Tobin's q ratio and the real exchange rate, being associated with positive and unstable roots. In this case the determinant must be negative. If this is again not satisfied, then the model will be unstable in the sense described previously.

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